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COMMAND AND GENERAL STAFF COLLEGE
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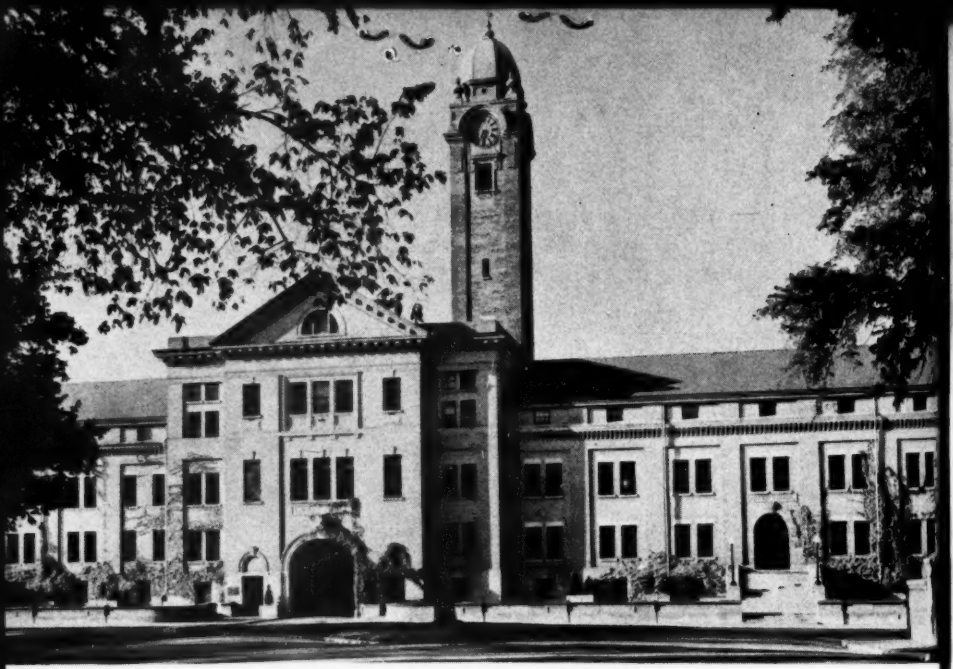

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ESPRIT DE WHAT? OUR ARMY AND MORALE

Major General H. W. Blakeley, *United States Army, Retired*

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

"THE most powerful weapon on earth is the human soul on fire," said Marshal Foch. Any army needs this flaming upsurge to win in battle. And our Army, along with the Marines, needs it more than the Air Force or the Navy. Its battle casualties are higher, its living conditions in a combat area are harder, and it is generally more dependent on the spirit of the individual to win.

The Air Force and the Navy, with some exceptions, have their men in containers. The combat performance of a bomber or destroyer is largely controlled by the plane's pilot or the ship's captain. Army combat performance is strongly influenced by leadership, but in the last analysis it depends on the fighting spirit of the individual soldier.

There is endless testimony to the fact that the single element that contributes most to this fighting spirit is esprit de corps, unit pride, regimental spirit, or whatever you want to call it. Unfortunately, individual rotation has made the soldier feel like a wandering stranger, not a member of a team.

Hanson W. Baldwin, military editor of *The New York Times*, summed up the situation this way in a *Saturday Evening Post* article:

Today, rotation and turnover, and the Army's replacement system, have made the fine old regiments—Custer's 7th Cavalry . . . the 38th [Infantry], the 9th, and the rest—merely numbers on the roster; not living, breathing parts of a continuing tradition.

The services must at all costs build up unit esprit. . . . A service "home," less rotation, less career guidance, less emphasis on individual schooling and training, more unit integrity and cohesiveness —these are the needs.

There has been ample evidence of similar thinking in letters to the editor of the *Combat Forces Journal*. A National Guard major general wrote: "We will never win the next war with those faceless things that G1 calls 'bodies'—we must have units that know their traditions and will die for them." A corporal wrote a bitter letter from overseas about the "wasted pride" of veterans who made great efforts to get

Solutions to our morale and rotation problems run up against the cold mathematics of men and money. The fact remains that battles are more likely to be won when the men who fight them have pride in their unit

back to their regiments but did not "find the 'personality' they left." The British infantry, he said, has high morale:

The reason lies in organization. Each British soldier . . . belongs to a regiment. Each regiment has a personality which its history gives it, a tradition brought down by the old ones in the outfit.

Feeling of Security

From the viewpoint of the young soldier —in distinction from consideration of the stimulus to win in combat—the soldier's need to feel that he "belongs," that he is the member of a military family, is greater in peacetime than in wartime. This need comes partly from the lack of national interest in the Armed Forces in time of peace. It stems more from the fact that more than half of the young men enlisting in periods when the draft is not operating usually come from broken homes. Whether the home difficulties are caused by death, divorce, or an unsympathetic stepfather or stepmother, the recruit needs and gets a feeling of security when he joins a unit and stays in it throughout his enlistment.

Traditionally and logically, the Army has built its infantry esprit on regimental pride. In armor and in the artillery—where the battalion has generally become the color-bearing unit—the battalion is the logical level.

Can something be done to give our Army the unit pride which is clearly valuable in war and in peace? How is it that the Marines, the British, and, perhaps, the Soviets have better esprit? At what level is the "unit replacement system," which Mr. Baldwin says the Army must have, desirable? At what level is it possible? Should divisions be rotated—or regiments, battalions, companies, platoons, or squads —or, as has already been tried, 4-man teams?

Let us take a look at some of the outfits that are supposed to have much higher morale than our Army. When Mr. Baldwin deplores—in his article—the lack of esprit de corps in our Regular services, he always inserts, "except for the Marines." He reflects, of course, an opinion held by many—certainly including the Marines.

Basically, the Marine's pride is based on constant emphasis in all training—from boot camp on up—that "You are a Marine." It is a sound basis in a relatively small organization. The Marines nearly lost this advantage when they expanded to a huge organization during World War II, began to use division shoulder patches, and in other ways departed from what is a sound system in a small corps.

British Regiments

The British regimental system, which has worked well over the years, is actually more like our Marine Corps organization than regimental in our Army sense. The British regiment is not a tactical organization like ours. It is rather a group of battalions bound together by an honorary colonel and sometimes a colonel in chief, plus tradition, history, a regimental march, distinctive uniforms or at least insignia, and other intangible but binding ties. The Black Watch Regiment, for example, may have only 1 or 2 battalions in peacetime, and expand to 20, 30, or 40 in time of war. These battalions will rarely serve together—even two or three of them—but the recruit is normally

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"brought up" in the regimental depot by officers and senior noncommissioned officers with long service and great pride in their regiment. When a Black Watch recruit goes to his battalion—perhaps on the other side of the world—he makes the trip with other Black Watch soldiers, and joins what has become to him a part of his family—a battalion of the Black Watch.

To quote a distinguished British Army officer: "Pride in regiment is still the foundation of the British soldier's stubborn valor." When the survivors of the battalion of the Gloucestershire Regiment that was nearly wiped out in Korea returned to England, they were received with ceremonies, honors, and general public acclaim that must have added much to regimental morale. How many Americans know that it was the 1st Battalion of the 21st Infantry Regiment of the 24th Division that first met the Communists in Korea?

Our own Army, throughout its history, has done much—sometimes with assistance from Congress—to destroy unit pride. In 1815, all infantry regiments were combined into fewer units and renumbered. Major Ganoe said in his *The History of the United States Army:*

Some sinister effort must have been at work to deprive all the old regiments of their traditions and spirit. For no plan could have more shrewdly damned any existing pride and affiliations than the way the Army was diabolically jumbled.

General Herr in his recent book, *The History of the United States Cavalry,* tells how the same thing happened to the cavalry in 1861. "This changing of names," he says, "was bad for morale, for the years had accumulated many traditions and much sentiment about the old titles." The artillery had similar experiences. It sometimes functioned as single, numbered batteries; it was sometimes organized into lettered batteries and numbered regiments.

Death of a Division

Old stuff? After World War II, as a former commander of the 4th Infantry Division, I did everything I could to prevent the inactivation of the division's 8th, 12th, and 22d Infantry Regiments—three of the oldest and most distinguished regiments in the Army. I was told that temporary inactivation made no difference.

The regiments were indeed reactivated in a few months, but with almost completely new rosters of officers. Many noncommissioned officers of long service had been scattered to various schools and other installations and could not get back to their regiments even though a considerable number, discharged at the end of the war and unwilling to trust the recruiting system during the days of hysterical demobilization, had paid their own way or hitchhiked to the station of their regiment to re-enlist. In the case of one regiment, the regimental commander, several months after reactivation, could find no trace of the officers' mess equipment, or of the pictures, trophies, and souvenirs acquired during the long history of the regiment.

As recently as 1953, the colonel of the 2d Infantry Regiment—another of those that had been inactivated—appealed for information about the location of the "trophies, mementos, pictures, and related material" of his unit. Temporary, expedient inactivation of regiments *does* make a difference, for continuity of history and tradition contributes greatly to what psychologists call "group character."

A suggestion often made is that our regiments should be named rather than numbered, but this hardly seems to be a forward step in the building of morale. The use of a nickname such as "The Garry Owens" for the 7th Cavalry Regiment, "The Old Guard" for the 3d Infantry, "The Wolfhounds" for the 27th Infantry, or "The Double Deucers" for the 22d Infantry is something else, and adds a distinc-

tive touch without losing what little we have retained of regimental tradition. A number, as applied to a regiment, can become as distinctive as a number often is in civil life. Fifth Avenue, for example, brings to mind a picture of a standard of luxury.

The Trouble With Rotation

"Pride in a military unit," as *Time* once said, "is often a good substitute for big pay in a blanket factory," but even with every discouragement to the development of this pride, good leaders have achieved amazingly good results—particularly in Korea. Individual rotation, as S. L. A. Marshall pointed out in *The Atlantic* after a tour in Korea, was supposed to be a bulwark to fighting morale and a conserver of human material. "Analyzed in the field," he says, "where men were fighting, it proved to be none of these things." He quotes a general as saying: "The trouble with rotation isn't that we haven't made it work, but that someone in Washington will get the idea that it's good."

Face the Music

General J. Lawton Collins, after a visit to Korea in early 1953, praised the "continued high morale of the Eighth Army," but pointed out the fact that "we are literally rebuilding it in the face of the enemy for the third time."

Individual rotation overseas and career management as currently practiced are designed to be coldly, mathematically fair to each soldier. The 2-year draft law adds to the problem, of course, but, to quote Mr. Baldwin again, the Army's personnel policies are in his opinion "execrable," and various nonessentials "have been emphasized, whereas the basic job of any armed force—to create effective fighting units—has been subordinated."

Mr. Baldwin's solution is certain to be regarded as a little vague by the General Staff:

We must bring back the bands—figuratively, as well as literally. . . . A regiment begins to coalesce as a unit when it marches, battle streamers fluttering from the staffs, behind its own band.

Each division now has one rather large band. The same number of men divided among three infantry regiments of a division would give each regiment its own band available to play a battalion along a road or to play for a medal presentation or retreat ceremony. If there must be a concert band to play symphonic music at division headquarters, the three bands could be combined occasionally for the purpose. It is significant that many regiments try against considerable odds to organize field music—drums and bugles—in order to have marching music of their own.

Only the Army General Staff, with complete knowledge of the pressing factors of money, men, and transportation involved, can work out a detailed solution to give the Army back its regimental and battalion esprit with the resultant improvement in teamwork and reduction in the strain on unit commanders which goes with the present high turnover both of officers and enlisted men. If it can be done, the Army should be a more attractive place for career officers and noncommissioned officers—and even for those who serve for 2 years.

Training Regiments

Organizations everywhere are, of course, constantly losing men by reason of expiration of terms of service, desertion, death, physical disability, or family hardship. Replacing these losses with teams of four men or with squads, platoons, or even companies has some advantages. But the advantages gained from the instilling in the recruit of pride in his regiment or battalion are lost unless these men come from a depot or divisional replacement center that has the specific mission of preparing

soldiers for the organization to which they are to be assigned.

One possible solution to the problem, therefore, is a training regiment in this country for each division overseas. The training regiment's composition could be varied to meet expected needs, and both regimental and divisional pride would be developed early in the soldier's career. Career officers and noncommissioned officers returned to this country would normally be attached to this training regiment to the extent that it could use them with due regard for school assignments and other detached service. They would remain assigned to their overseas regiments or at least would be permitted to wear their insignia. Under this system there would necessarily be some assignments of officers and noncommissioned officers to regiments other than their own if some units were to stay for long periods either overseas or in this country.

Another solution is to move regiments of infantry and battalions of other arms overseas and back *as units* at intervals of about 18 months, replacing only one organization in a division at a time. This would probably be more expensive in terms of transportation costs, and would result in the disappearance of the long-established association of regiments and battalions with a specific division. A plan along these lines is now being developed with the hope that if world conditions remain reasonably peaceful, it can be inaugurated as early as 1955.

The moving of entire divisions has many obvious advantages from the viewpoint of teamwork and morale. There is also the point that in case of war we would probably have a division-in-being in transit instead of several thousand unassigned individuals of no value for emergency use.

All solutions run up against the cold mathematics of men and money, but that does not alter the fact that battles are more likely to be won when the men fighting them have warm pride in their units.

Morale is not achieved by order. It is not something that comes from without. It germinates in the human heart—it feeds on the human spirit—it draws sustenance from kith and kin—it is intangible—a spiritual strength that enables men to endure sacrifices up to death for the things they hold dear.

It springs from a clear realization of what is most precious in life—what is worth fighting for, what is worth more than life.

It comes from a faith in the ideals and spiritual values which have made our Nation great and which have sustained us in every crisis. It is a faith which imbues men with a sense of privilege, not of enforced obligation, when they are called upon to serve the Nation and the cause of freedom. It inspires men to come to their great tasks as did the Fathers of our Country, who in the hour of decision pledged to the cause of liberty their lives, their fortunes, and their sacred honor. It imbues men with the spirit of those millions of gallant men and equally gallant women who, in all the wars our Nation has been obliged to fight, saw the shape of things as they were and stood up to them in defense of their faith.

General Matthew B. Ridgway, Retired

The Split Infinitive Is Here to Stay

Lieutenant Colonel Anthony L. Wermuth, *General Staff*
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The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

IT WAS in 1952, I think, that a friend of mine, a Parisienne, spoke with relief of the fact that the *Academie Francaise* had finally made up its mind on *pas encore*. The "s" could now be correctly sounded when speaking the phrase, a sound which had not previously been approved—or was it the other way around? In any event, the French nation considered that another certainty had been established, despite the French Academy's occasional disclaimer (since 1635) of omniscience in such philological decisions.

There has never been established for the English language an authoritative body comparable to the French and Italian Academies, although many, including both Dryden and Swift, in 1664 and 1712 respectively, have tried to establish one. That the English language has thus never been embalmed is attributable to a deep and continuing conviction that too much would be lost by so doing, that the linguistic climate of English is constantly changing to the over-all advantage of the language. Simeon Potter, the British authority, has pointed out that correctness in English is measured principally by the standards in use by the best writers.

Nevertheless, there are numerous professional and nonprofessional writers who would fix the language as of some period, preferably as of the time some years ago when they themselves were taking their last course for credit. As of that date, they have embalmed for themselves every single principle, rule, and exception relating to English, and insist that others do the same. Such eccentricities are harmless, of course, unless they happen to belong to one's superiors—who may never have been aware that "the linguistic climate of English is constantly changing."

Some months ago, an article in the MILITARY REVIEW chafed the language of some military sentences, wondering how anyone could have understood them after one reading. The view presented was wholesome and represents an outlook which is generally pervasive through the whole of Army teaching about writing. Still, in the interests of completeness, it is fair to say that there *is* another side, especially when the one side is overstated in practice.

Consider, if you will, an ex-military man who had learned military art, science, and practice 30 years ago. Suppose he subsequently immersed himself in some other way of life and has neither seen, studied, nor heard of any additional military theory or development since 1925. Now, suppose he were to do another about-face today and plunge into discussion of contemporary military matters.

Many officers would be amused at the presumption of an ex-military man who

had had no contact with military matters for 30 years, but who attempted to discuss current military affairs. Yet many of the same officers propound rules of English who have not consulted an authority on language since they sold their texts after Freshman English. There is some difference, of course, in that contemporary reading over the years inescapably transmits some knowledge of language changes to everyone. A professional man cannot escape some contact with up-to-date writing, whether he does any of it himself or not; whereas, it is easier to miss entirely the changing thought in a specialized field—such as the military field. Nevertheless, while there are immutables in the practice of writing the English language, just as there are in the military field, there are also shifts, just as in the military field, in emphasis, in various aspects of vocabulary, grammar, and writing forms.

Split Infinitive

Consider the phobias of a generation ago, which live on in some quarters today, against splitting infinitives and ending sentences with prepositions. Such silly rules stem from sensible bases—in this instance, from the undeniable conclusion that final prepositions and split infinitives *usually* result in awkward statements. The damage was done when those who translate everything into absolutes transtions, the vehicle being the following anecdote:

A small boy asked his father to read to him at bedtime. The father suggested a particular book, but the boy declined that one. The father brought it along anyway. When the boy saw it, he exclaimed, "What did you bring that book that I didn't want to be read to out of up for?" The catch, of course, is that not all five are here used as prepositions. Nevertheless, the construction is a dandy performance.

Concerning the splitting of infinitives, Fowler's *Modern English Usage*, of high standards, reason, and good humor, and withal as authoritative as an authority can be, maintains that:

. . . a real split infinitive, though not desirable in itself, is preferable to either of two things, to real ambiguity, and to patent artificiality. For the first, we will rather write 'Our object is to further cement trade relations' than, by correcting into 'Our object is further to cement . . .' leaves it doubtful whether an additional object or additional cementing is the point. And for the second, we take it that such reminders of a tyrannous convention as 'in not combining to forbid flatly hostilities' are far more abnormal than the abnormality they evade.

Another sacred cow is "brevity." It is perfectly true that the simplest statement is *usually* the clearest, but not *al-*

The linguistic climate of English is constantly changing—to the overall advantage of the language. It would pay for us all to take the time, periodically, to catch up with authoritative changes in our language

lated "usually" into "always" and made a rule—which the best authorities never did recommend, even then—that one must *never* split infinitives or end sentences with prepositions. No wonder some derisive and more astute soul eventually devised a sentence ending in *five* prepositions.

ways. The one quality which is always more important than brevity in any piece of writing, but about which far too little is said, is clarity. Shortness, simple shortness, if that were the be-all of expression, would compress all expression into telegraphic style, or even monosyllables, de-

pending, perhaps, on mental telepathy for complete communication. We recognize this absurdity, of course, by eschewing telegraphic style in normal writing, not only because it violates other canons of good writing, but especially because it is seldom able to convey meaning clearly. I would suggest that instructions toward brevity always be put this way: Be as brief as you can, provided you are *above all* clear.

Sentence Length

It is remarkable to reflect upon the alleged requirement of certain top administrators to compress discussion of every subject onto one sheet of paper, whether substituting for 4 pages or 400. This basis is sometimes reported as a conviction that "anything worth saying can be said in one page." Such dicta are self-defeating, and require renunciation of clear communication in favor of arbitrary statement. In a sense, it is like eating one bite of each course of a meal, or, to use a more accurate simile, as if one were to try to go from New York to San Francisco by traveling only the last 100 miles. It takes words to express thought; to express complicated thought, it takes many words. To be sure, if one chooses between emphasizing either wordiness or brevity, one rightly chooses brevity because brevity tends to assist clarity. However, brevity is often misunderstood to mean *shortness*, which is not at all the same thing.

Considering only sentences, it is perfectly true that short sentences tend to have the advantage over long sentences in conveying simple ideas clearly (and in permitting the inept to express *any* ideas with comparative clarity). However, beyond the elementary stage, what matters, fundamentally, is the construction of the sentence, not the length. Generally speaking, it does take more skill to construct long sentences which are clear than short sentences which are clear; but provided the necessary skill is there, length is immaterial.

Consider this example of only 14 words, once actually submitted to me in a paper: "I was standing in ranks without the usually filled space in front of me." What does it mean? I have puzzled over it for a long time. It is short. Why is it not clear? Contrast it with this familiar sentence of 71 words, beginning the Declaration of Independence:

When in the course of human events, it becomes necessary for one people to dissolve the political bonds which have connected them with another, and to assume among the powers of the earth the separate and equal station to which the laws of Nature and of Nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation.

This is perfectly clear. By its skillful construction parallelling the interrelationship of the ideas it expresses, does it not convey more meaning than a series of shorter sentences could do within the same number of words? If you do not believe it, try to construct such a series.

Incidentally, the Declaration of Independence, a document justifiably admired for its clarity, consists of 36 sentences which contain an average in excess of 36 words. The three longest contain 110, 127, and 179 words, respectively.

An objection might be advanced to the example quoted from the Declaration along the lines of another language phobia, which in reality stems from a misunder-

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standing of the purpose of language. The objection goes like this: "Well, the sentence might be clear to you, but I had to read it through twice, and one part three times, before I fully understood it." It seems to me that what may be objected to, no doubt unconsciously, is not the complexity of the wording but the complexity of the idea. Complex ideas take time to be absorbed. To ask that one invariably be able to comprehend such ideas after one reading of their statement is to ask that one be given genius. A statement of an idea may or may not be clear, but even at its clearest possible statement, the idea itself may require intensive study. My point here is not to assume automatically that it is the sentence which is responsible for your having to read a statement more than once in order to understand it.

Sentences are never merely "too long." Note William Faulkner, who has received the Nobel Prize for literature, and whose sentences sometimes run on for pages. I would not recommend attempting to imitate Faulkner, nor even recommend long sentences, but simply recommend de-emphasizing the entire question of length in favor of clarity. More important, dip into an authority every 10 years or so, and catch up with authoritative changes in the linguistic climate. Finally, I would commend Flaubert's three simple principles of good writing as more important than all the others: "The first," he said, "is clarity. The second is clarity. And the third is clarity."

THE MISSION OF THE MILITARY REVIEW

The MILITARY REVIEW has the mission of disseminating modern military thought and current Army doctrine concerning command and staff procedures of the division and higher echelons and to provide a forum for articles which stimulate military thinking. Authors, civilian and military alike, are encouraged to submit materials which will assist in the fulfillment of this mission.

Competition for Military Writers

Remuneration for all published articles submitted by military writers (active-duty personnel of the uniformed services of the United States Armed Forces and students of Allied countries while attending the Command and General Staff College) in the magazine is on a competitive basis.

Monthly Award—All articles written by military authors published in each issue are reviewed by a board of officers representing the Command and General Staff College. The board selects the first and second best articles published each month. The authors of the selected articles receive $100 and $50, respectively.

Annual Award—When 12 monthly awards have been made, the 12 first place articles are reviewed by the Faculty Board and the Annual Award article selected. The author of the Annual Award article receives $350.

The selection of both monthly and annual awards is based upon the soundness, readability, completeness, reader appeal, accuracy, substance, originality of thought, authoritativeness, and the over-all merit and quality of the article.

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Reimbursement for published articles submitted to the MILITARY REVIEW by civilian authors (to include retired military personnel, and reserve personnel not on active duty) is on an individual basis.

FIRST REQUIREMENT

Lieutenant Colonel Carl H. Wohlfeil, *Artillery*
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UNITED Nations forces under the United States Thirtieth Army—consisting of United States and Allied corps—have been engaged with Aggressor for the past 7 months.

In the early stages, Aggressor achieved tactical surprise against the numerically inferior United Nations command and threatened to gain his objectives within a few short weeks. However, through the efforts of the delaying forces, and by virtue of having control of the air and sea, United Nations forces gained sufficient time to establish a defensive line and reinforce it with hastily organized units from overseas.

For several weeks a virtual stalemate existed with each side gaining a series of local successes and building up reserves. The fate of the United Nations command hung in the balance daily while Aggressor tried to break the deadlock.

In the third month, United States and Allied forces launched an offensive that drove Aggressor far back into the recesses of his own domain. After 8 weeks of relentless exploitation, the end was in sight. Then, Aggressor suddenly was joined by overwhelming forces from his neighboring state and the tide of battle was again reversed. In the process of this reversal, Thirtieth Army suffered extremely heavy losses in men and material. Losses among commanders were staggering. The Army Commander himself was a casualty and was replaced by a new commander.

After further hardships and rugged resistance by units all across the front, Thirtieth Army was consolidated on a line generally just below the original state boundary. There followed several weeks during which United Nations forces were rehabilitating battered units and preparing to meet further attacks. The Ninth Tactical Air Force, with absolute air supremacy, hammered Aggressor unmercifully while he was attempting to prepare for a new offensive.

At this juncture, the new Allied Army Commander seized the initiative and launched a series of offensives of his own. The story was being told that, in the course of the general withdrawal by Thirtieth Army, the new Commander was being briefed on the plans for consolidation and defense. After some considerable dissertation on the gloomy aspects of the situation by the staff, the General impatiently called a halt to the discussion and demanded, "Now let me see your plans for the offensive." True or not, it was an example of moral courage worthy of emulation—and the story alone, because it was so typical of the Commander's reputation, did much to bolster the flagging spirits of his hard-pressed Army. The latest of these offensives started in early February and consisted of attacks by native divisions supported by task forces of United States and other Allied troops.

Initially, the going was slow and difficult. The weather was brutally cold. Many of the troops were new to combat—and the memories of the dark December days were still fresh in the minds of the veterans. However, the local successes across the front seemed to take the steam out of Aggressor's punch and the task forces were making headway in isolated prongs against dogged but diminishing resistance. The troops began to regain some of their offensive spirit and there was even an air of uneasy, tentative cockiness among the recent replacements.

Special Situation

You are, up to this moment, Lieutenant Colonel Practically Nobody—a supernumerary, a replacement, a reinforcement, and a stranger.

It is approximately 0730 on one of the coldest, dreariest mid-February days you can, or ever will, remember. How did you get here?

Less than 3 days ago, you left your job on the III Corps staff and were assigned to the 20th Division because you had just been promoted out of your job. You arrived at the Division command post at 2000 and, after an interview with the Chief of Staff, you were introduced to the Division Commander and the staff. The Chief of Staff assigned you temporarily as an Assistant G3 until such time as you could join the 59th Infantry Regiment where you would take command of a battalion. Elements of the Division were reinforcing native units across a 30-mile front. At the time of your arrival, word had just been received at Division Headquarters that the 59th Regimental Combat Team had been surrounded by the enemy and was consolidating its position pending relief.

Late in the afternoon of the following day, a staff major, who was escorting you on a visit to the available units, took you up a long, winding valley road and introduced you to Lieutenant Colonel Keene, commander of the 1st Battalion, 58th Infantry Regiment. His battalion, together with a field artillery battalion and a battery of antiaircraft artillery, constituted Task Force Able supporting the offensive of one of the native divisions. The remainder of the Regiment was operating in a sector almost 10 miles to the east. Initially, the attack progressed satisfactorily, but met with increasingly strong resistance against well dug-in positions on high ground.

After pointing out the progress of the battle for Hill 1095 from his observation post, Colonel Keene invited you to spend the night with him at his command post. You declined the invitation because you were scheduled to stand the midnight shift in the G3 Section that night. Keene seemed to have everything well under control and as you took your leave, he asked you to assure the G3 that the Big Hill would be taken early the next day. You returned to the Division command post.

Entries in the G3 journal for the period of your duty that night indicate that the following events occurred:

2350: You took over as duty officer in the G3 Section. The major you relieved briefed you on the situation, and assured you that the occasional reports of small probing attacks by the enemy were not unusual or alarming. You also learned that corps had taken over full responsibility for the relief of the 59th Regimental Combat Team and had organized an armored task force for that purpose.

0110: 1st Battalion, 58th Infantry Regiment relayed a report from their liaison officer with the native division that the native troops were drifting back from their hill positions. Neither this report nor previous reports have indicated any significant enemy pressure in this sector. The Division Commander ordered them back into line.

0200: Many small groups of native troops were straggling through the support area. Keene reported that many did not have weapons; he was unable to determine

While the techniques may vary with the situation and the individuality of the commander, the principles of leadership do not change. The leader must know his job, know his men, and—above all—set the example

the situation from them. Wire lines from Keene's command post to the native division command post were out. Only sporadic small arms fire could be heard on the hill. Keene alerted his force and occupied defense positions. The G3 was notified of this action.

0350: Keene reported that the native division commander was unable to halt the withdrawal of his troops. The reserve of this division was committed and melted away before it reached the assembly area. Firing on the hill had almost stopped.

0413: Heavy mortar fire and grenades began falling in the artillery positions. Burning vehicles and ammunition were lighting up the area. Keene's positions were subjected to heavy attack from three sides. Native troops were pouring through the artillery positions, and it was now quite difficult to distinguish between friend and foe. Keene requested authority to withdraw behind the first ridge line to his rear at daybreak. The G3 notified the Chief of Staff and obtained authority to alert the 20th Division reserve—consisting of one battalion of the 60th Infantry and two companies of the 20th Tank Battalion—for movement on order to support the withdrawal of Task Force Able.

0430: The entire operational staff had been alerted; you were relieved and spent the remainder of the night in fitful sleep.

That briefly summarizes yesterday's happenings. There was still hope early in the morning that Task Force Able could get back through the narrow valley. As the day wore on, it became increasingly evident that Aggressor troops had drawn the noose tight around the trap. For Colonel Keene and his troops, it was that dark December all over again. At 0730, over coffee, powdered milk, and cold cereal you could never eat, the Chief of Staff discussed the situation with the staff, advising G1 and G4 to make preparations for replacement of personnel and equipment. The estimate went as high as 15 percent and they figured that would give them a sufficient cushion. The Chief said he was going down to see the Commander of the 60th Infantry Regiment and discuss the plans for the relief of Task Force Able. As he passed you on the way out, he paused a moment and then said, "You can go along, if you like." You said, "Glad to, Colonel."

As you piled into his jeep, it became clear that you were the gunner on this trip. The old boy had a *Thompson*, a carbine, and an *M1* equipped with a scope. They say he did a fine job of bagging Aggressors with that sniper rifle last December.

As you rode forward, you passed long lines of native troops headed for the rear. They had no expression, no weapons, and no apparent leadership. It struck you that there did not seem to be anything but privates in that outfit, but then you observed one who looked nattier than his fellows. There were pinholes in his cap and on his collar, but no insignia. The Chief called to him, but he either did not understand English or made a good pretense of not being able to understand. In any event, it proved useless to try to get any information from this drifting, aimless sea of humanity.

You came to a major road junction and halted. Here the Chief pointed down the left fork and said:

That's where Task Force Able should be coming out. I want you to stay here and

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direct any of the units that come by here back down the road we just traveled, while I go to the 60th command post. I'll radio back to Division to have a control point set up to receive them.

So you got out and took your post at the road junction, while the Chief took off down the road to the right.

There was a small cluster of houses just to the north of the road junction that showed on the map as a town. Some of the houses were in fairly good shape—as native houses go—but the rest were almost completely destroyed. In spite of the cold, there was a stench in the air that stung the nostrils with its sharp, penetrating, sickly smell. In what must have been a schoolyard, a small detachment of United States Military Police was trying to round up and reorganize a mob of milling, frightened, leaderless native troops. Many of them were in native civilian dress and there was no way of telling whether they were friend or foe.

About an hour after your arrival at the road junction, mortar shells began to land sporadically just off the road and among the buildings of the town. Almost as though on signal, the entire mob of native troops dashed out of the schoolyard and across the road heading south. The handful of military police made a valiant, but hopeless, effort to stem the tide but were swept aside. The mortar shells evidently were not of very large caliber which indicated that whoever was firing was not very far away. A little later, the mortar rounds were interspersed with what was probably very long-range machinegun fire. You could not hear the weapons firing, but the low whine of the spent bullets and the splatter and tinkle as they caromed off the stones in the road and hit among the tin roofs in the village did nothing to brighten the prospects for a good day.

You began to feel hungry. You glanced at your watch and noted with amazement that it was 1500. You decided right then to revive the old lesson you learned during the Battle of the Bulge in 1944—whenever you get a chance to eat a meal, eat it, even if you eat seven times a day. You may never know where your next meal is coming from. Your mouth waters even at the thought of that cold cereal you passed up that morning.

An ordnance lieutenant drove up in a jeep. He was looking for the 79th Field Artillery Battalion. Somebody had told him they would probably be needing help that morning, and he was ordered to find out what could be done for them. You invited him to hang around and wait for them to come out of the trap. When he learned you had been there over 6 hours, and the outlook, along with the daylight, was getting dimmer by the minute, he decided he would check in with Division Artillery and wait. You managed to cadge a package of hardtack biscuits and a small tin of jam from him before he left.

It was almost 1600 when the Chief returned. He admitted, apologetically, that he had forgotten you and made up for his thoughtlessness by digging out a couple of cans of his favorite spaghetti and meat balls that he had cached away under the seat of his jeep. Naturally, you forgave him. Any other attitude would have been ridiculous.

By this time, the shelling in the little village had increased somewhat and you notice a small group of Allied troops setting up their 81-mm mortars just below the crest of the low ridge line above the village. You asked the Chief how things were going. He hestitated a moment, then grumbled something about not having had any word from Keene for almost 2 hours, and about the agonizing delays and confusion in getting a relief force organized and started. However, the relief force was on its way now, and it was hoped that it would be able to break through before darkness fell. They would

have to go like hell, you thought as you charged full speed into the can of spaghetti and meat balls.

When you returned to the command post, you found yourself in the midst of the ordered confusion that bespeaks a displacement of the command post. A hasty meal had already been served and the few leftovers were about to be discarded. You grabbed a stray messkit, filled it with the already chilling fodder and set to work on it. The Chief wandered off to confer with the Assistant Division Commander. From the looks of the faces and the lack of conversation, it was evident that the war was not going well here. The G3 stopped to say that the Chief of Staff had asked him to maintain an advance command post there through the night in order to receive and direct any units or individuals who might get through the trap before morning. It was not the instinct for self-preservation, certainly, that made you offer to stay there with him because the odds were 10 to 1 that the advance command post would not remain there through the night—for one reason or the other. However, it was better than the possibility of being designated as a forgotten road marker again. So you volunteered.

Meanwhile, the road running north and south near the command post was becoming clogged with vehicles and men headed south. The collapse of the native division had exposed the flanks of two other units and compelled them to withdraw. Several detachments of United States and Allied troops had also been cut off, like Task Force Able, and were fighting desperately to break out of the ever-tightening trap. Aggressor had not been content to merely draw a noose around the beleaguered units; he was pressing his attack to the south. The relief forces sent to rescue Task Force Able found themselves hard pressed after having advanced only a few hundred yards.

The vehicles of the Division command post moved out to the road some 300 yards to the east and were swallowed by the serpent column creeping southward. Darkness fell and the movement on the road became a petulant, insistent murmur of low-geared vehicles and grumbling men. You sat down in the one remaining tent, made a little conversation with the G3, a signal company lieutenant, and a couple of noncommissioned officers, then lapsed into a tense expectant silence. There really was not much to say. The G3 set up a schedule, issued a few instructions, and went out to check the "perimeter." A medium artillery battery had gone into position 200 yards ahead of the command post and the G3 went to arrange some "mutual protection." You had to admit it, the man had a sense of humor.

You had been assigned the 2400 to 0400 watch so you lay down to rest. You dozed restlessly and heard everything that was said or went on about you. At 2330, you got up automatically and searched around for a snack in the dim lantern light—the mantle on the Coleman was hanging on by a shred and it was sputtering desperately to hold onto its waning life. No one dared touch it because there were no mantles left. You dug up a hard chocolate bar and sat on a box munching thoughtlessly. Your bones ached from weariness, and you realized you were beginning to reach that dangerous mental stage when you did not much care what happened.

In the subdued, turgid backwash of the calamity that seemed to be going on around you, you dozed fitfully at the phone. Occasionally, you aroused yourself to check with the detail on the road to learn if any of the Task Force Able units had come through yet. Each time the report was negative and you went back to the phone to report—negative.

By midnight, the noises on the road subsided and the only sound was the occasional thunder of artillery rolling over

the snow-covered hills. The periods between seemed long and pregnant with doubts and speculation as to how many were left out there between you and the enemy. A string of flares suddenly showed over the low hills—a mile to the west—lending an eerie, flickering light to the surroundings, which immediately became peopled with imaginary, threatening shadows all intent on closing in and crushing you into oblivion.

At 0200, the reports were still negative. The voice on the other end of the phone had been downgraded to a lieutenant. Maybe that was better, because for the past hour or so you had been almost ashamed to call with the same report that really was not a report—as though you felt personally to blame that no survivors were appearing. Now the lieutenant was calling you and it was a little easier that way.

Fifteen minutes later, the Chief of Staff was on the phone asking for the latest information. You notified him there were a few individual stragglers that had come through with no idea where the remainder of their units were. Yes, he knew that, he had talked to some of them—most said that their vehicles and heavy weapons had been abandoned early the previous day, many were burned, blown up, or pushed over the cliffs.

At his request, you aroused the G3 and they talked for a few minutes. When they rang off, the G3 told you to notify everybody to get ready to move out. The artillery was moving back about 2 miles and a separate Regimental Combat Team—the 70th—was establishing a defensive position generally through the line of hills directly in front of your present location. March order and move out.

The luminous hands of your watch recorded the increased tempo of your activity.

0240: The tent had been struck and equipment loaded; the one remaining "hot" wire line to Division had been spliced into a circuit to the 70th Regimental Combat Team up forward; the outposts had been rounded up; and the advance command post moved out. The road was almost deserted.

0315: You arrived at the new Division command post, had a cup of hot coffee at the mess tent with the Chief of Staff and G3, and then turned in. The Chief was trying hard not to admit that they were about to write off Task Force Able as a complete loss.

0635: Just about everybody was up as you rolled out of your sack. It was cold and the sky outside the tent was leaden with the threat of more snow. You struggled into your boots and overshoes, slopped some water over your face from your canteen, rinsed your mouth with more of the same—that stuff tasted awful, especially at that time in the morning—and blinked your way over to the mess tent.

The Assistant Division Commander was there along with the G1 and several other members of the staff. The General looked very tired and somewhat worried. You learned later he had been out most of the night trying to locate the remnants, if any, of Task Force Able and tying in the available Division units with the 70th Regimental Combat Team that had taken over part of the division sector. An aide came in to report that a handful of men and officers from the 1st Battalion, 58th Infantry Regiment had just turned up at the 70th Regimental Combat Team command post.

0655: The Assistant Division Commander finished his coffee and got up to leave, saying he was going back up to visit these people from the 1st Battalion. He looked at you, asked casually, "Want to come along?", and almost without waiting for your reply, turned and strode out of the tent. He stopped briefly to confer with the Division Commander and then joined you in his jeep. On the way for-

ward, he remarked that the Commander of the 58th Infantry Regiment would probably have to operate with only two battalions for awhile. Since the Regiment was so far away and was heavily committed, it would be best to keep the 1st Battalion under Division control until it was reorganized. For the rest of the trip, he was grimly quiet and apparently lost in thoughts and plans.

0720: You arrived at the 70th Infantry Regiment command post and were immediately impressed by the confusion and disorder that met you there. These separate outfits, you thought, seldom had the same pride and snap that supervised divisional units had. However, you swallowed hard and bitterly when you realized that these bedraggled, haggard, filthy clots of subhumans, clustered dejectedly about the small bonfires, were apparently all that remained of a once proud 1st Battalion, 58th Infantry Regiment.

The executive officer, 70th Infantry Regiment reported. The General thanked him for feeding our men and then dismissed him. An elderly and obviously senior captain reported to the General saying he had just joined the 1st Battalion, 58th Infantry Regiment, 5 days ago; had been temporarily assigned as an assistant executive officer; and knew very few of the officers and men of the battalion. So far as he had been able to determine, he was the ranking officer remaining—no one had seen the battalion commander since noon of the preceding day. A hasty check showed there were 8 officers and approximately 200 men present. The officers included an assistant S3, a rifle company commander, the heavy weapons company commander, and five platoon leaders—three of whom had been with the battalion in combat less than 4 weeks. Now they were veterans. The number of senior noncommissioned officers was also pitiably small. The General introduced the sergeant major—the only noncommissioned officer in the Regiment who had been with it during World War II. In spite of his appearance, he was obviously a topnotch soldier. He had lost the upper plate of his false teeth during the night and was not very happy about it. He was not very happy about anything except that he was alive and out of the trap. There was no kidding about this—these men had just been through a very rough deal.

The General talked to the officers, asking about several whom he knew personally. It was an unnerving experience to hear accounts of how this one or that one had been killed. Some had been last seen, sorely wounded, leading a small group of men in a gallant, hopeless attack against the enemy. One young lieutenant, his naturally dark complexion blackened by grime and a 2-day-old stubble matted and crusted with frozen dirt, and a jagged hole in the skirt of his field jacket, stood there and wept unashamedly as he choked out the story of the fate of his company commander. Bravest guy he ever saw—and he sobbed like a baby. The commander who took over this outfit would have a job on his hands. You were glad you were scheduled for that battalion in the 59th.

The General made a few appropriate remarks about being genuinely happy that those present were alive and safe. Vehicles were on the way to take them to the rear and they would feel better as soon as they had cleaned up and had some rest. He hoped, and was confident, that many of their companions would manage to filter through and get back to our lines in the next day or so.

Your Situation

You sense that the General is about to leave and you glance at your watch. It is 0733. You feel more than ever your role as the inconsequential spectator—you are a part of this organization, but strangely detached and not very vital.

At this point, the General said, "Well,

son, it's all yours. This is your battalion." The General gives you what is certainly intended to be a reassuring slap on the back, salutes the ragged knot of officers and men standing about, mounts his jeep and is off.

What do you do now? How do you demonstrate your qualities of leadership?

The principles of leadership do not change. Techniques of applied leadership vary with the situation and the personality of the commander.

It is generally assumed in academic discussions of leadership problems that the capabilities of the troops—individually and collectively—and the ability and experience of the commander are constant factors. In such discussions, it must necessarily be so for several reasons, not the least of which is the need for a basis on which to evaluate solutions. Other reasons have their foundation in the psychology of the American soldier and the fundamental soundness of our entire system of military training.

Nevertheless, those factors are not constant and there is at least a vestige of dubious veracity in such expressions as, "the American soldier is unbeatable; he is unaffected by adversity" or "any officer who attains the rank of colonel should be qualified to command a regiment." Not all the trembling and fumbling is done in the camp of the enemy.

Depending upon personal experience or research, there might be any number of immediate reactions to a situation such as the one portrayed above. One reaction might be that it is preposterous, things like that do not happen in our Army. It is an unreal situation.

But is it? Discounting innumerable historical examples affecting foreign armies —allied and enemy—we can find plenty of instances in our own recent military history to lay any such an objection to rest. Recall the battles of the Kasserine Pass in February 1943, the Hurtgen Forest and Schmidt late in 1944, the Ardennes in December of that year, Kunu-ri and the Chosen Reservoir in another dark December of 1950, or such somewhat smaller actions as those at Chipyong-ni and Hoengsong in February 1951. These are only a representative few. No doubt you can think of many more. Who rebuilt the shattered units that survived those operations?

It could happen again—to you.

Another reaction might be that the obvious solution is to remove these men from the combat area, provide the necessary rest, hot baths, good chow, a reissue of clothing and equipment, and follow up with a period of a month of reorganization and training. That would be the most desirable solution, of course. Surely, if we spend anywhere from 6 months to 1 year in the Zone of Interior to train a unit for combat, 1 month or 6 weeks in this situation would not be unwarranted. The only drawback to such a solution is that the very situation which created the present condition of the unit operates against its improvement. The enemy pressure is still intense. There are no units available to replace the one that was decimated. Divisions are already covering three times their normal frontage. Every available man is desperately needed on the line. So, despite the Assistant Division Commander's statement that these men are to be transported to the rear for rest and rehabilitation, it will be necessary to formulate plans for a resumption of an active part in the current battle on very short notice. Such plans must necessarily encompass a temporary organization, command and staff structure, and refitting of the troops.

As you stand in the center of this dilapidated little mass of soldiery, the immediate problems—morale, organization, and equipment—are obvious, and their solution will require timely and sound decisions. The time, of course, is present and

the sound decisions are not readily at hand. However, they are yours alone to make.

The Situation

Morale is unquestionably low. The antidote does not lie in an issue of beer and a USO show. Creature comforts must come first. Something can be done immediately to ensure that all the men have been fed. Then—with the assistance of the 70th Regimental Combat Team—the direst needs for clothing and footwear can be met. Medical attention for those who require it can also be obtained—but reasonable care must be exercised against the incipient dangers of "bug-out fever." By setting an example of confidence and determination, the commander must combat any tendency for the troops to slide into the disastrous slough of self-pity. It will be difficult to convince these men that he fully understands their situation and appreciates the extent of the ordeal they have been through, since he did not experience it with them. However, by his understanding attitude and firm actions, he must gain their confidence and co-operation before he can hope to accomplish any positive results. Pompous and flamboyant speeches about courage and duty, harsh ultimatums about discipline and soldierly conduct, or glowing promises of relief and a long period of rehabilitation in the rear areas should be avoided. They can serve only to antagonize or to build hopes which might prove false too soon, and, ultimately, result in complete distrust.

What is needed here and now is to reassure these men that they have acquitted themselves well under unusually adverse circumstances, that their needs will be taken care of as quickly as possible, and that their wholehearted support bolstered by their self-respect and pride in their unit will be needed to achieve the renewed battle-worthiness of the battalion. A short review of the general tactical situation—particularly as it affects the other units of the Division, plus what you know of the general measures being taken to frustrate the enemy's offensive —will not only serve the purpose of "keeping the men informed" but will help to dispel rumors of a general catastrophe. By recounting the gallant stand being made by the 58th Infantry Regiment, he can also rekindle the pride they have in their Division.

It is almost impossible for a battalion commander to get to know all of his men—even his officers and noncommissioned officers. Even in a situation such as this, with less than 200 men, it is not likely that he would be able to know all of his men for some time. However, he can identify himself with them and with the unit by his obvious willingness to share their future with them. This can be accomplished by maintaining a cheerful countenance, and by occasional words of encouragement and confident determination that, together, they will rebuild a proud and efficient unit.

There is one other danger worthy of mention which must be guarded against and nipped in the bud early if it manifests itself. Whenever a unit is subjected to a severe ordeal by sudden and surprising enemy attack, an immediate reaction usually is that "somebody higher up" blundered. As a result, the witch hunt is on for a scapegoat. In an aura of self-pity, there is an inevitable tendency toward recrimination, accusation, and deterioration of confidence. To forestall or combat such a trend, the commander should first of all outline the plan for rehabilitation as early as possible, and, then, exploit every opportunity to publicize the assistance and support being furnished by his superiors. He must impress upon his officers and noncommissioned officers, particularly, that regardless of where the fault may lie, nothing can be accom-

plished in an atmosphere of distrust. Such an atmosphere sours the disposition, and will shatter the doubtful morale of replacements.

In the way of organization, a command structure must first be established. In this case, there are a number of possible logical alternatives.

First, reorganize on the basis of previous company organization regardless of the number of survivors in each company. Appoint company commanders from among the officers available. That would leave a maximum of three officers for staff functions.

The second alternative would be to disregard all previous company affiliations and organize the available officers, noncommissioned officers, and men into equal company detachments.

A third alternative would be to organize a single rifle company with a full complement of officers and enlisted men.

A fourth solution would take advantage of the presence of the heavy weapons company commander, and, with the personnel he had remaining, organize a reduced heavy weapons company to support an understrength rifle company.

Under the circumstances, one of the latter two alternatives would probably be best, at least temporarily, because of the possibility that this "battalion" may be called on for active participation in the battle still in progress.

If heavy weapons are available, the fourth solution would furnish the best tactical organization. Further, it would provide for the most effective use of those personnel with special training such as heavy weapons men, and those who, for physical reasons, might not otherwise be effectually employable.

Purely from the viewpoint of simplified administration, messing, and supply, the single company organization has a decided advantage, at least until such time as replacements and the major items of equipment begin to arrive.

Although not of the highest priority, consideration must be given to plans for the reassignment of the available officers and noncommissioned officers to form nuclei for the companies which are to be reconstituted. A high percentage of the replacements from other divisional units to fill key positions—company commanders, key staff officers, first sergeants, and squad leaders—should be men who were serving in those positions at the time in order that, during the critical period of reorganization, both the rank and the file will not be entirely inexperienced. In this respect, close co-ordination with and between tne regimental commander and the Division G1 is mandatory.

As a further consideration in the temporary immediate organization, provision will have to be made for a skeleton staff. For the time being, an executive-adjutant, and a supply officer, with the necessary enlisted assistants, should suffice.

Insofar as equipment is concerned, priority must be given to individual equipment—clothing, mess kits, toilet articles, blankets, shelter halves, and personal weapons. Until such time as additional cooks and kitchen equipment become available, a single mess can easily take care of the entire group and will minimize the problem of ration breakdown.

During the interval before the transportation arrives to take the men back to an assembly area, there are several things which can be done profitably. Separate all the men by previous company affiliation and get a list of those present. Take care of those medical cases who require immediate attention. Gather up all equipment and weapons preparatory to loading on vehicles. Begin an inventory of the essential items of clothing and individual equipment which will be required to replace those lost by the men who are present.

Get busy and formulate plans to keep busy—for in activity lies the remedy for despondency.

Joint Operations--Operation *Ivy*

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The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

SINCE the first detonation of an atomic weapon at Alamogordo—Operation *Trinity* in 1945—the progress of weapon development has been fostered by continuous field testing. Tests of the smaller detonations are conducted at the Atomic Energy Commission Proving Grounds in Nevada, while the larger ones—requiring a greater degree of safety—are detonated in the Marshall Islands of the Pacific Ocean.

Operation *Ivy* was the fourth in a series of overseas atomic weapons tests carried out by the Atomic Energy Commission (AEC) and the Department of Defense (DD). It was conducted on Eniwetok in November 1952. The first tests—Operation *Crossroads*—had been conducted at Bikini in 1946 under the command of Vice Admiral W. H. P. Blandy, United States Navy, with the Chief of Naval Operations acting as the executive agent for the Joint Chiefs of Staff (JCS). The second—Operation *Sandstone*—was conducted on Eniwetok in 1948 under command of Lieutenant General John E. Hull, United States Army. The third series of tests—Operation *Greenhouse* in 1951—also conducted on Eniwetok, were under command of Lieutenant General Elwood P. Quesada, United States Air Force.

Joint Task Force (JTF) 132 was organized and trained to conduct Operation *Ivy*. The JCS designated the Chief of Staff of the Army as their executive agent who, with the concurrence of the AEC, appointed Major General P. W. Clarkson, United States Army, as the Joint Task Force Commander. *Ivy* was complex and unique in many respects. Yet, the joint task force organization developed for conduct of the operation followed the simple precepts established for the organization of joint forces within the Military Establishment. The successful integration of a large and important civilian body of the AEC within the task force, in full partnership with the three military services, is the greatest single achievement of the organization planning. So successful has been this integration that Gordon Dean, former Chairman of the AEC, wrote of it in glowing terms in his recent book, *Report on the Atom*:

Perhaps it is in order to suggest that there are instances in our present (atomic) program where some real progress in military-civilian co-operation has been achieved. Take the Joint Task Forces, for example, which are established to conduct the weapons tests at Eniwetok. These Task Forces are established jointly by the Department of Defense and the Atomic Energy Commission. The two agencies agree, and they have always done so with no difficulty, on a Task Force Commander. He may be an Army General, or a Navy Admiral, or an Air Force General. Members of his staff are made up of civilians from the Commission and representatives of one or more of the services. The responsibility for the various phases of the operation are divided into various compartments, and, here again, military men and civilian participants work shoulder to shoulder. In several instances the civilian deputy commander of the Task Force has had officers of the three services reporting to him.

The Mission

The initial announcement of the task force mission was cryptic indeed. The joint AEC-DD statement of 18 February 1952 simply stated:

The Department of Defense and the United States Atomic Energy Commission announced today that preparations for a new series of tests at the Commission's Eniwetok Proving Grounds are being carried out by Joint Task Force 132.

The tests were conducted in November 1952, but it was not until a much later date that the full import of the mission of *Ivy* was disclosed to the public. This was done by President Truman in his state of the Union message on 7 January 1953:

Since Alamogordo we have developed atomic weapons with many times the explosive force of the early models, and we have produced them in substantial quantities. And recently in the thermonuclear tests at Eniwetok we have entered another stage in the world-shaking development of atomic energy. From now on man moves into a new era of destructive power, capable of creating explosions of a new order of magnitude, dwarfing the mushroom clouds of Hiroshima and Nagasaki.

Initially, the task force commander is beset with the immediate problems of organization, personnel and equipment procurement, and training for the mission. He conveys his requirements in this respect to the JCS. This is accomplished by the preparation of a report which is transmitted to the JCS through the executive agent. To facilitate processing the report, it is desirable that the paper be prepared in appropriate JCS format to include the specific memorandums contemplated to be dispatched to the respective service chiefs and other departments to implement the provisions of the basic report. Thus, upon approval by the JCS, the report is complete in every detail and requires only administrative processing of the enclosures, letters, and implementing memorandums.

The task force commander should prepare this basic document for he knows more about the details of his mission than any other agency. He indicates specific and detailed requirements wherever possible. A provision is included in the report permitting direct liaison between the task force commander and each service and agency involved to permit modification of the requirements as may be necessary from time to time. The latter provision is a critical necessity for it is manifestly unwieldy and time-consuming to submit additional reports to the JCS each time a change in force requirements becomes necessary. The development of a test program, or for that matter the development of any mission of a joint task force, is bound to require some changes in force requirements as details of the operation are worked out. Direct liaison and authority to deal with the respective services expedites modification of equipment and personnel needs. On the other hand, items of significant substance requiring a major change in the mission, change in the date of execution, or a major shift in concept must be brought to the attention of the JCS.

The successful integration of civilians within a task force, in full partnership with participating members of the three military services, is the greatest single achievement of the organization planning

The mechanics of and format for submitting a report to the JCS are readily available and will not be discussed here. It may be of interest to point out, how-

ever, that diagrams, pictures, and charts that convey a thought readily and clearly are welcome in such reports. For example, note Figure 1 whereby the task force commander conveyed a major aspect briefly and precisely.

The Organization

The organization shown in Figure 2 gives a picture of the command structure of Joint Task Force 132. At the highest level, the AEC and the JCS co-ordinate on matters involving policy and over-all direction. The Chairman of the Military Liaison Committee of the AEC—under the new DD organization he has the additional title of Assistant to the Secretary of Defense for Atomic Energy—is established by law to ensure an effective tie-in between these high-level policy bodies on matters pertaining to the military application of atomic energy. The executive agent for the JCS controls the execution of the operation through the task force commander. A direct channel is provided between the AEC and the task force commander as a great deal of co-ordination is necessary at this level in respect to the test programs.

The task force commander has operational control of the four task groups, although the AEC renders the necessary scientific direction to the Scientific Task Group. This task group is charged with the responsibility for conducting the scientific experiments. A civilian contractor, comprising one of the many task units within this group, accomplishes the engineering and construction essential to the success of the test program and the maintenance of the Eniwetok Proving Ground.

The Army task group mission comprises ground security, communications, equipment and vehicle maintenance, and all elements of logistic support to include port operations.

The Navy task group provides sea and lagoon lift, air and sea security forces, instrumented ships for the experimental programs, and joint task force shipboard command post facilities during the afloat phases of the operation.

The Air task group operates major airbases in the area and a host of minor landing strips. It provides long- and short-range airlift, weather information, and instrumented aircraft for test operations.

Before discussing command relationships it would be well to outline briefly the organization of JTF Headquarters. The task force commander has considerable latitude in selecting the type organization for his staff operations. He may employ the general staff and special staff concept, or the joint staff type in which the activities of the special staff are integrated into the joint staff divisions. The Commander of Joint Task Force 132 selected the organization shown in Figure 3. Staff operations of J1, J3, J4, and the Comptroller are self-explanatory, and will be recognized as traditional duties of these respective staff divisions in military organizations. The work of J2, however, is more of a security nature rather than intelligence as we know it in the military sense. The wide scope of security arrangements necessary in a sensitive program of this nature is clear to everyone. In addition to physical security procedures and provisions, which number well in the hundreds, there is the critical problem of timely screening of every member of the task force by investigative agencies of the

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Government and the military departments.

The fact that J5 (signal communications) was placed on the general staff level may be of interest. The signal enterprise proved to be too enormous, too diverse, and entirely unorthodox to be considered as part of J3, which is normal in strictly military operations. This staff division really begins where most signal staff sections stop. For example, command communications are unusually complex due to wide dispersion of the forces. In addition, the command post structure is changed radically when the task force is afloat. Yet, difficult as they are, command communications are only a very small part of the problem. Add to this the multiplicity of circuits required for air and naval communications for both test and security operations, the complex and sensitive electronic controls for the scientific test programs, internal television and facsimile operations, and weather data collection and dissemination over the wide Pacific Ocean, and one can realize the magnitude of telecommunications and electronic controls necessary in an operation of this nature.

As for the makeup of the staff, the author believes it important that the commander, the chief of staff, and J3 be of the same service. The control of all phases of the operational task is the heart of the problem. Much has been written about the desirability of having a chief of staff from a service other than that represented by the commander. Under many circumstances this will work for, after all, good people make up good staffs; not the color of their uniforms. However, in operations

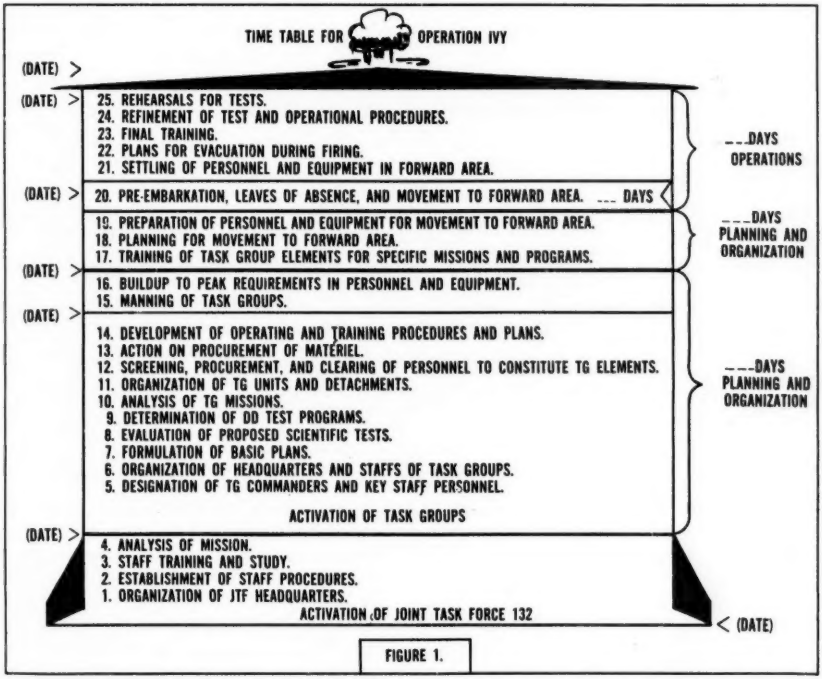


FIGURE 1.

that represent fast-moving situations there is frequently an overwhelming requirement for fast thinking and rapid communications between individuals; for a quick, mutual, and decisive recognition of the problem and its solution. It is in this sphere of activity that the tools for operational control must be geared to the commander at every staff echelon.

From Figure 3 it can be seen that officers of the service of the executive agent were appointed as chiefs to the majority of staff divisions. This was coincidental, and is not considered necessary or desirable. Aside from the position of J3, already discussed, it is desirable that the Comptroller represent the same service as the executive agent. The funding problem is facilitated with this arrangement. The other top staff assignments could well be distributed among the other participating services.

In the *Ivy* Operation, J5 was logically an Army officer as the great majority of signal troops were provided by the Army, and thus procurement and training were facilitated. As the Army maintains the permanent year-round garrison at the Pacific Proving Ground, this would appear to be the best and most convenient arrangement for all task forces operating in the area.

The assignment of an Army officer as J2 resulted from a series of circumstances which made available an able, experienced, and proved intelligence officer from that particular service. Like all troop units, joint forces compete for personnel against requirements elsewhere; in the final analysis, they do the best they can in the way of duty assignments based on the personnel that is available.

All services were represented within each staff division. The deputy division chiefs were of a service other than the service represented by the division chief. Throughout each staff division there was a proportionate balance of officers and enlisted personnel from the several services; the staff was truly joint at all levels of operation. An interesting aspect is the fact that military personnel worked under the direction of civilian leaders, and vice versa, successfully and in complete harmony. Substantial numbers of military officers and enlisted personnel operated under the direction of the Deputy for Scientific Matters, and under the civilian commander of the Scientific Task Group. On the other hand, there was a liberal sprinkling of civilians in JTF Headquarters and in the Air task group. Mutual confidence and respect, up, down, and laterally, and a dedication to the

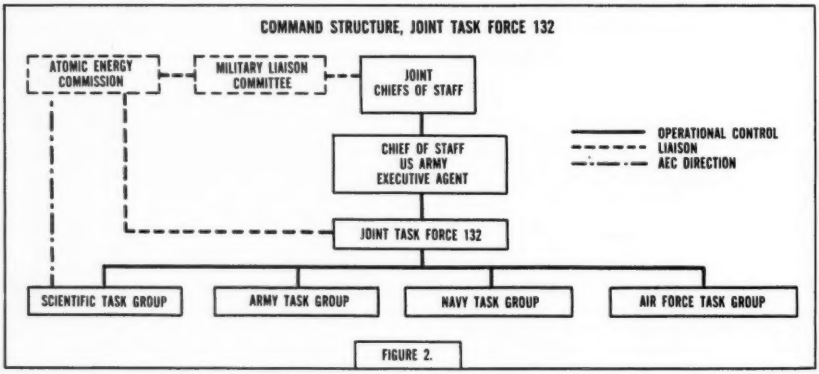
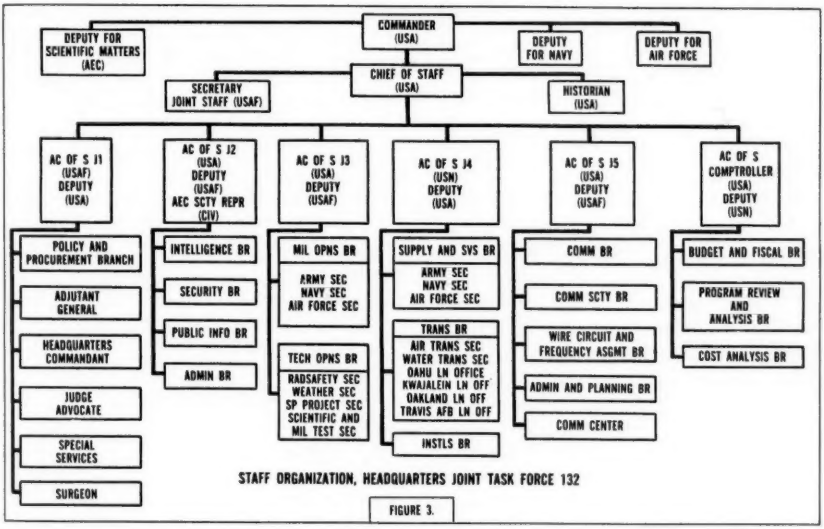


FIGURE 2.

mission are the ingredients that mold Americans into strong joint enterprises. Where these ingredients are present, an organization works well with only incidental interest in whether military or civilian members are playing the dominant role. The mechanics of organization do not provide these ingredients; they come only with the exercise of leadership at the highest level. An organization reflects the will and the character of the commander in all that it does or fails to do.



STAFF ORGANIZATION, HEADQUARTERS JOINT TASK FORCE 132

FIGURE 3.

The command relationship of the JTF Commander with respect to the military units of his command is normal; however, there is a technical problem involving the civilian units of the task force. By federal statute (the Atomic Energy Acts of 1946 and 1954) certain responsibilities are assigned to the AEC. To ensure that the JTF Commander has full and complete operational control of the civilian elements of the force during test operations, and to permit him to act freely in the many other matters involving the technical aspects of the project, the AEC appoints the JTF Commander as their representative. Thus, no legal limitation hampers the JTF Commander in the conduct of operational control over the entire force. Sometimes we find different interpretations of "operational control." In joint forces, this control must comprise those functions of command involving the composition of subordinate forces, the assignment of tasks, the designation of objectives, and the authoritative direction necessary to accomplish the mission. It does not include administration, discipline, internal organization, and unit training. Normally it does not include logistic support, but the special character of *Ivy* required that the JTF Commander enter many logistic aspects when the services could not provide special materials and scientific equipment, and also for the purpose of modifying and instrumenting ships and aircraft.

It is noted that the military deputy commanders are not in the chain of command, either in troop command (Figure 2) or in the staff organization (Figure

3). They perform duties as advisors to the task force commander in regard to operations of their respective services. They have direct access to the task force staff, their respective service task group, and their respective service at the departmental level. They perform a valuable service as technical advisors, expediters, and assistants to the task force commander. The decision to keep them out of the chain of command proved eminently sound as it facilitated staff action in the normal concept of military staff operations, and it provided a device for direct and intimate relationship between the task group commanders and the task force commander.

The Deputy for Scientific Matters is a special case. In addition to his duties as technical advisor, similar to the other deputies, the JTF Commander employs him as Director for Scientific Test Operations. Consequently, this deputy has a more direct relationship with the Scientific Task Group, and, in fact, frequently issues orders directly to this task group in pursuance of the test program and the commander's desires. As the commander is a military man, manifestly his knowledge of scientific details of the numerous and complex test programs is limited. As a consequence, the employment of the Scientific Deputy in this manner is indicated. This calls for the greatest mutual confidence between the two as an essential ingredient to success.

The Operation Plan

In joint operations during World War II, a great variety of formats were developed for "operation orders" and "operation plans." The Armed Forces Staff College has accomplished a remarkable feat in developing standard forms for all types of joint plans, orders, estimates, and annexes. The Armed Forces Staff College Instructional Guide, *Joint Staff Documents*, 25 August 1954, published by this joint school, is a "must" for joint staff officers.

In Operation *Ivy*, it was determined that the operation plan (rather than an order) would be most effective as an instrument to set the JTF in motion. As the date of the contemplated operation was in the future, an approximate date was given. Suitable assumptions were made in the plan to permit realistic planning, training, and provision for logistic support of the subordinate units. Between the date of issuance of the plan and the operational phase, modifications and refinements were issued as more detailed and firm information became available. Thus, the operational plan was an active document providing the maximum information to the subordinate commanders from the early date of activation of his forces, and permitting concurrent planning at all echelons. The date of initiation of the operational phase was transmitted to the subordinate commanders by dispatch, and on that date the plan became an order.

The outline of the task force operational plan for *Ivy* may be of interest. The table of contents of this plan appears on page 29 of this article and gives the broad scope of its substance.

How to Make It Work

The above can be termed the nuts and bolts of the organization—setting up the machinery, so to speak. The important thing is to make it work. The first requirement is people. Get the best available for the command and top staff slots. They should be proficient in their own service specialty, of course, but equally important they must be clear thinkers and flexible operators. In a joint operation there is a good deal of give and take; of appreciating the other fellow's point of view. Sometimes you find yourself taking the long detour to get a point across or to get a procedure or order published. The important thing to remember is that a

joint task force organization integrates forces from the several services, but it does not merge them into a monolithic unit. Each service retains its own identity and performs its tasks in its own way. Consequently, only broad direction should be given to the task groups, and details egates responsibility and authority to the task group commander who determines how the task is to be performed. Not only should the task group commander have the requisite freedom of action to decide how to accomplish his mission, but he is the one best able to make the decision

OPERATION *IVY*

Operations Plan

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of execution left to the service commanders. Successful command in joint operations requires centralized direction and decentralized execution. Centralized direction at the JTF level is essential for the purpose of formulating a common basic doctrine and cohesive plan to achieve the common goal. Decentralized execution deas to the manner in which his task group should be organized. Where co-ordination is required between task groups, let them work it out among themselves but retain control of the timetable by publishing a chronological checklist of all tasks to be accomplished.

Whenever you get the three military

services together there is the problem of co-ordination. Add to this combination a civilian group, and you have a real omelet. The best tool to be developed and employed at all echelons of the joint force is mutual understanding and confidence. This is the lubricant that makes a joint operation progress smoothly. If there is mutual trust up and down and laterally, problems of procedure are worked out and differences are resolved easily. Where this lubricant is lacking, the joint force is overcome by petty sectional viewpoints, and by a series of small tugs of war and minor crises. It would not be amiss to suggest that where mutual understanding and confidence is present, even a poorly conceived operations plan will be executed successfully. Where it is absent, however, even the best plan will fall short of success. The greatest aid in the solution to this problem is the personal visit; get out and see the people of the various units on their home ground during the planning phase. The written word and the message dispatch often convey a thought, tone, or nuance that was not intended. On the other hand, personal visits and face to face frank discussion resolves differences miraculously. Also, it helps you to learn the other fellow's language. You find, for example, that the civilian's "difficult situation" is the Army's "flap," while the Navy uses "bind," and the Air Force prefers "hassle"—they all mean the same thing. Once mutual confidence is firmly established, the letters, memorandums, and dispatches become live instruments conveying exactly the thought and tone you had in mind when writing them.

It may be trite to mention training rehearsals as we all are imbued with their value. For joint forces this is a critical necessity. A task group may be proficient in the conduct of its own service task, but how will it perform in concert with the other services? Invariably this will be a new experience to most commanders. Joint rehearsals of all major phases of the contemplated operation will disclose flaws or misunderstanding. For example, an Air Force air-refueling phase calls for the stationing of a destroyer at a rendezvous point. Civilian personnel must be transported by Army helicopters to designated destinations on split second timing. Air Force helicopters in one phase will operate from a Navy aircraft carrier. Air Force weather information collecting aircraft must feed data into a Navy weather central. Civilian personnel will operate aboard an airborne controller aircraft. Army communications are linked into Navy, Air Force, and civilian circuits. The only way the commander can ensure that these intraservice activities will come off as planned is to train and test by joint rehearsal.

In conclusion, Operation *Ivy* was a joint enterprise in every respect. The tests were conducted not as individual AEC, Army, Navy, or Air Force tests, but rather as a composite test plan under single supervision. The agency or service having paramount interest in any particular test was appointed as monitoring agency. However, the results were immediately available to all. In this concept of operation the joint task force was successful. On 17 November 1952, a joint AEC-DD press announcement included significant praise for the many thousands who had toiled to ensure success:

Scientific executives for the tests have expressed satisfaction with the results. The leaders and members of the military and civilian components of the task force have accomplished a remarkable feat of precision in planning and operations and have the commendation of the Department of Defense and the Atomic Energy Commission.

LOGISTICS OF THE FUTURE

Colonel Thomas F. Donahue, *Ordnance Corps*
Ordnance Officer, Headquarters, Seventh Army

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

CURRENTLY the military finds itself in a peculiar situation—one without precedent in our history as a Nation. Although we are ostensibly at peace, we find it necessary to maintain a large standing Army, Navy, and Air Force. The threat of aggressor nations and a number of other factors force us into this anomalous situation.

Normally the military would undergo a dormant or resting stage during which the services would shrink to relatively small proportions. The greater part of the Navy would go into mothballs, the air fleet sold, and the Army would be reduced to numbers scarcely adequate for garrison, school, and civilian component duty. The Marines would police the Western Hemisphere. A few depots and arsenals would continue on a modest scale with a relatively small number of career employees.

To recount the valid reasons for maintaining our "strength in being" would be redundant. Nor are we advocating this resting stage. The day of a million men springing to arms is definitely gone. Such a posture at this time might well be fatal. The point we wish to make is that during the resting stage the military architects could design a new protective force which might eliminate many of the obvious defects in our present system. Starting more or less from scratch we could create a perfect military machine—with adequate logistical support. It is frequently far more difficult and more expensive to rebuild a dilapidated house than to erect a new one.

To revamp our present logistical support system is far more complicated than rebuilding an old house. Living in this logistical dwelling are many tenants, each with a vested interest in his particular portion of the building. With few exceptions, they will view with a jaundiced eye such alterations as might jeopardize their future security.

Therefore, if we are to hold our strength in being, both in the combat forces and its logistical support, and yet eliminate the obvious flaws which exist, we must attack the problem vigorously. This impending struggle to prepare for a future all-out war to preserve our way of life will be no less real than the war itself—although it be waged in the realm of ideas. In logistics, particularly, we encounter all too frequently the attitude of Dr. Pangloss of Voltaire's *Candide*: "Everything is for the best, in this best of all logistical systems." So the process is that we add a little here, a little there, and we have, presumably, what is "better than the best."

If we must cut the defense dollar, let us cut the fat from logistics, not the muscle from our combat forces. This Nation could afford many more divisions with the money currently wasted in the pipeline

What we need is more of the vitriolic comment found in Briffault's *Reasons for Anger* or, occasionally, in *Combat Forces Journal* editorials, followed by positive corrective action. The logistical support during World War II was neither efficient nor economical. It was appallingly wasteful—a severe drain upon our manpower and natural resources. On many occasions it failed to meet the requirements of the combat forces. It cannot possibly be effective in the future unless radically changed to meet the challenge of changing doctrine. We have relied too long on "sugar coating."

The strictly military aspect of logistics has been given a great measure of undeserved credit. The industrial production of the Nation poured into the logistical pipeline unquestionably was an important, if not the decisive, factor in winning the war. However, there is insufficient proof that the pipeline itself was operated efficiently. In fact, the evidence would indicate otherwise—that it was grossly inefficient. The deficiencies of the pipeline have never been fully revealed because the total effort was successful. The logistical side of the picture is normally less interesting—certainly it has less reader appeal—and so its weaknesses have been ignored.

Yet, the increasingly important role of logistics is gradually creeping into the literature of warfare. Unfortunately, it is seldom emblazoned in the headlines. It requires considerable sifting of the evidence—and interpolation or even extrapolation—to read it into the script. The fact that it is there at all indicates progress. All too frequently logistics is considered independently—something apart from the main issue. When logistics is included in military histories, sales are reduced correspondingly. When logistics is omitted from plans for future operations, results may be catastrophic. Yet, few writers on future trends in warfare consider the impact of an outmoded supply support system when planning the new look.

In this respect, it was interesting to contrast the movie, "Desert Victory," with the recent book, *The Rommel Papers*. In *"Desert Victory,"* the final defeat of the great *Afrika Korps* was attributed primarily to the military genius and inspirational leadership of Field Marshal Montgomery—who did not hestitate to invoke divine guidance. This, combined with the mental and physical toughness, courage, and audacity of his Eighth Army prevailed over the *Korps*. Field Marshal Rommel offers a different slant on the same subject.

The tank—the armored knight of the twentieth century—unquestionably reached its zenith as king of the battlefield in North Africa. The various considerations for this conclusion are too lengthy to discuss in detail here. Earlier in the campaign, Rommel had been successful in prodding his mechanics to restore tanks to serviceable condition in a matter of 1 or 2 days. However, as the supply of replacement units, parts, and assemblies—including engines—from his base in Italy deteriorated, the number of knights he could muster behind the line of departure diminished. True, he was also short of petrol and ammunition but he stresses his lack of tanks. The finest mechanics in the world could not cope with the industrial might of Detroit—and American tanks flowing in from Detroit by way of Egypt spelled the difference. So says Rommel.

Colonel Thomas F. Donahue was Ordnance Officer of United Kingdom Base during World War II. From 1947 to 1950, he served on the Ordnance Staff of Sixth Army at the Presidio of San Francisco, California. His next assignment was at Letterkenny Ordnance Depot where he subsequently assumed command from 1951 to 1953. He is presently serving as Ordnance Officer of Headquarters, Seventh Army.

Given equal pipelines, would the outcome have been different? We wonder. Possibly what we in logistics require is someone to dramatize the battle of the pipelines in the manner Stevenson dramatized the life and death struggle in another pipeline—the circulatory system of the body. Currently, the battle is waged between the proponents of new superweapons and those who continue to urge that the foot soldier and the leader are still requisites for success in the all-out struggle. Generals Marshall, Bradley, and Collins were all staunch advocates of this latter concept, and the rallying point recently has been around Generals Ridgway, McAuliffe, and Gavin. The "lean and mean" philosophy of Gavin fits into a logical pattern to dovetail logistics into the new look for combat forces. We believe logistics deserves equal importance with leaders, men, and research and development.

World War I Concept

It is not intended to imply that combat leaders have been oblivious to the importance of logistics. The military leader of today is light-years ahead of C. S. Forester's *The General* who, during World War I, petulantly inquired why it was so difficult to transport poison gas. After all, gas was lighter than air. If not, he argued, how did gas cause balloons to ascend? The General also had a simple solution for failure of trucks to bring needed supplies up to the battlefield. He court-martialed the driver. How this dire threat was transmitted to an axle—ready to snap—is difficult to understand.

The General's lack of insight into the mysteries of logistics was not emphasized by Forester. It was almost an aside—a device to illustrate one facet of his character. Far more prominent to the author was the role of the callous General in holding the line when French troops were reported to be deserting.

Logistics, as a study, was still relatively unimportant in World War I. It is questionable whether all the literature on the subject would add up to a small fraction of that devoted to the above mentioned defection on the part of the French forces under General Nivelle. Death sentences resulted, and postwar litigation clogged the French courts for years. Resorting to a casual disregard for time and circumstance which is the prerogative of the novelist, William Faulkner revives the subject in *The Fable*—a recent publication. Many books, some plays, and at least one movie have been devoted to the subject. People are interesting. Logistics is a dreary subject.

World War II Pipeline

World War II has been described variously as an armored war, an armored and air war, a war of highway transportation, or the first perfect example of the total war. It may also be described as the war of the "Pipelines" or the war of the "Great Buildup." Consider the preparations for Operations *Torch*, *Overlord*, or *Anvil* and the analogy should be obvious.

For the purpose of this discussion we consider the "pipeline" as extending only from the facility or vendor to the troops —leadtime for procurement contracts is not included. The pipeline starts when the material supplies become Government property and it ends when those same supplies are consumed. Since we wish to avoid fighting on two fronts, let us assume it contains no canned or bottled beer, ice cream freezers or mix, soft drinks, or the like.

During 1942-45, streams of replacement food, trucks, tanks, parts, and ammunition were flowing from the United States to focal points throughout the world. An entirely disproportionate share of the national effort and resources was expended in maintaining this pipeline. Frequently, the pipes spewed out the contents on bar-

ren soil. S. L. A. Marshall describes the mountains of supplies remaining on Omaha and Utah Beaches when our combat forces were at the Rhine, yet the total quantity outside the United States bore little relation to the input in the hinterland, for reasons which we shall discuss later.

Economy of Means

A review of several recent articles dealing with logistics reveals an increasing awareness of this problem. Brigadier General Paul M. Robinett, United States Army, Retired, cites the appalling waste resulting from violation of the "principle of economy of means." He emphasizes that the United States can never again afford the luxury of such waste. Without sacrificing the means for all-out effort to ensure victory and to preserve our way of life, he concludes: "There must be no waste or nonessential utilization of effort or of resources, and the military planners must be reasonably correct in their assumptions and estimates."

"Economy of means" carries Clausewitz' principle of economy of force one step further by including the logistical with the strategic and tactical. The broad principle approach must precede the detailed solution. The broad principles are the peaks, the headline catchers; the valleys are the normal work areas for the logistician. Recently, General Mark Clark was quoted in the press as warning ladies' clubs that women must, of necessity, be drafted in any future all-out war. That is a peak.

The logistician will weigh that in the balance. We utilized women in World War II, not only in the Armed Forces, but in factories and offices throughout the land. Women welded tanks and planes, ran locomotives, operated fork lifts, and performed thousands of tasks once considered man's proper sphere. If drafting of women for the Armed Forces is a necessity, it may be inadequate. Women within the Armed Forces may result in a deficit. The net effectiveness is reduced; the pipeline to support the added personnel will swell beyond its present unwieldy proportions. If we cannot win an all-out war except by drafting women, then possibly we further increase the odds by putting them into uniforms.

In the excellent article on "Logistics of Necessity" by Captain John D. Hayes, United States Navy, in the January-February 1954, *Ordnance*, the author urges simplifying the logistical processes. Captain Hayes offers the formula $L=F(MV^n)$—where L is dynamic logistics, M is mass of inventory, and V is velocity of supply or transportation. When V^n is omitted, L varies with M and we have static logistics depending solely upon inventory. He stresses transportation as the key to the problem.

We feel that Captain Hayes may have oversimplified the problem by assuming that transportation alone is responsible for the snail pace and gigantic inventories. Once this trouble is pinpointed, then "voila," we have the school solution. Speed up transportation; use the airlines.

Captain Hayes cites the Red Ball Express as indispensable to our successful prosecution of the war in Europe. If the situation is permitted to exist, the solution frequently differs radically from the preventive measures. The prophylactic approach seems preferable.

The pipeline, unfortunately, is almost static. To consider increasing the velocity presupposes we have a mass in motion. Only for brief intervals of time is any portion of the pipeline mass actually flowing. Newton's Second Law, which introduces the concept of acceleration as expressed by the mathematical statement $F=kma$ might well supplement the above. F is force, k is a proportionality constant, m is mass, and a is acceleration. No paraphrasing of this law would be valid without further analysis of the addi-

tional initial force to overcome inertia. Inertia exists not only in the mass itself, but in the entire logistical body.

Ammunition is an important item logistically. Disregarding the stockpiling or pipeline aspect and considering only the use of ammunition as an explosive, we find a suitable analogy. The strength of an explosive is measured by the "work done," or the force displacing mass through distance. Add the time element to this concept of work done and we have power. There enters a third consideration, called brisance—which is the velocity of detonation of the explosive itself. For ammunition of any given strength and power, stepping up the brisance will increase the over-all effect.

Improvement in the present system demands greater brisance in the logistical mass as contrasted to the mass in the pipeline proper. The effort must be directed to the cause, rather than to the effect. The slow transportation of supplies is by no means the primary cause of the appalling waste in the system. The basic flaws are apparent long before the transportation people take over. To avoid belaboring this point, let us repeat that increasing the velocity in transit is the solution to only one facet of the problem.

It is difficult these days to read any treatise on strictly military subjects which does not include at least one reference to Clausewitz' principles. This article is no exception. However, our logistics do not stem directly from Clausewitz. In applying the American interpretation of logistics, we are still fettered by the dead hand of Von Steuben. Von Steuben brought order out of chaos, but he exalted the accountant and the inventory far beyond their intrinsic worth. Bureaucracy has carried the ball from there. We have wasted billions keeping tab on our supplies.

The solution of the pipeline problem—as it affects the supply of bodies and the evacuation of wounded—is well on its way to a partial solution. The details are catching up to the broad principles. Replacements are being welded into divisions or battalions, and the total effective strength will no longer be reduced by those in transit. Possibly we may eventually eliminate the replacement depot.

Personnel Pipeline

In the past, the effective strength of the army in the field has been reduced by those coming and going. Half a million men, including those in training, were required to maintain 175,000 men in the field. Replacements were fed through the pipeline—first individually, then in small packets. A draftee frequently had completed half his normal tour of duty before he found a home.

The grouping of replacements into battalions, regiments, or eventually divisions will not only reduce the pipeline loss, but restore some of the lost esprit in our combat forces. One writer referred to this recently as the soul of the Army. Eventually, this concept may be extended to nondivisional units.

Likewise, the evacuation of casualties in the field has been accelerated by the helicopter, and restoration to full duty has been aided by advances in therapeutic methods. Lost time has been reduced to a minimum; the percentage of recovery in Korea far exceeded that of World War II. The problem of the psychopath may yet be solved.

Supply Pipeline

The solution to the problem of the pipeline as it affects supplies is still on the drawing board. For a rich nation, the solution seemed less urgent. If our resources hold out, we can still fill the cup to overflowing and depend upon a trickle to reach operational theaters. However, the apostles of the economy of plenty are gradually losing ground. This philosophy —essential to restoring the balance in 1932—is decidedly outmoded.

The pipeline problem is inherent in every research and development project.

The pipeline absorbs too high a proportion not only of our tax dollars, but of our natural resources. It has received too little attention in the past. The scientist is on the other side of the problem delving into pure science which eventually may be applied by technicians to development of the Ultimate Weapon. The true logistical area—between the factory and the line of departure—has been neglected.

The pipeline flow, as practiced by the services, flouts the laws of fluids in motion. The flow is diminished by successive withdrawals within the continental United States. Only a small part of this volume ever returns to the system or is used for direct supply of troops. Strategic reserves are locked in key depots; base shop requirements enjoy highest priority; and 240 days of supply is reserved in master depots with additional levels in filler depots. Distribution depots hold an additional 90 to 180 days of supply. Posts, camps, and stations are allowed up to 105 days, 60 days plus 45 days order and shipping time; subposts have lesser amounts; and units maintain their basic loads which must be complete to pass The Inspector General's rigid test. All these levels—except the basic loads in the hands of troops—are considered part of the pipeline fill, yet they actually reduce the head. The effect on velocity in the line and quantity at the outlets should be obvious.

Unfortunately, the waste does not stop at the port of embarkation. Overseas we have a complete duplication, the scope and complexity depending upon the size of the occupying force. Equal—if not greater—emphasis is devoted to stockpiling rather than to supply to the troops.

Shortly after the police action started in Korea, the production rate in the United States increased. This was to be expected. However, for many items the levels of supply at all echelons down to post, camp, and station were also increased. The objective was to protect against anticipated rationing of critical metals. Instead of girding for war, we immediately started to dissipate our strength.

The operation of the pipeline in a sense may be compared to the income tax. The greater the income, the greater the percentage paid in taxes. As with income, we frequently reach the point of diminishing return. The losses exceed the increased input rate, so that we emerge with a net loss. We can ill afford to produce more. Successively, additional depots are built, base shops started, more inspections, and more reprocessing; a general reduction in efficiency from new personnel. It is a losing game.

System Deficiencies

Let us consider a few facets of this monstrosity we call the pipeline, which contribute to its inefficiency and to the appalling waste which follows in its wake.

First and foremost is the terrific cost of acquiring, inspecting, accounting for, and storing the huge inventory in the pipeline. Time and time again when parts and supplies are not available at the right time, the answer is the failure to consider the insatiable hunger of the pipeline. The ratio for pipeline requirements compared to consumption needs will vary up to 50 to 1. Truly, it is the logistician's nightmare.

In many European countries, the purchaser of a suit of clothes is furnished with extra buttons and a few pieces of cloth sufficient for the life of the suit—and it is, of necessity, a long life—a simple solution applied to a simple problem. Recently an officer of long standing recalled the good old days when each unit on the post was shipped its annual supply of training ammunition and spare parts for its weapons in June. Why would this system not work today? The weapons had

remained unchanged over the years and mortality of parts had been reduced to a science. The button and swatch of cloth solution certainly has its advantages. The once-a-year issue to the Army is related at least generically.

However, equipment for the military today is more complex. Models change quite rapidly. Ordinarily, there are no commercial counterparts for the complete unit and too little effort is expended to adapt requirements to available commercial components. The first expense of development and manufacture is the least part of the total costs. The advantage of using commercial counterparts is that the bugs have been eliminated and repair parts requirements fairly well established. A kit of parts cannot be designed to meet all requirements for 1 year on special equipment.

Recently, we saw figures which averaged approximately 60 days of supply. Individually, the items varied from out of stock to 90 years' supply based on issues for past 90 days. The spread from zero to 90 years is extreme, it is true, but it points up the tremendous problem when we attempt to maintain tailormade equipment around the globe statically. The stocks are always out of phase. A set pattern cannot be successful in coping with a fluid situation.

Each stop or stockpile point represents an appreciable loss through delays developed by the sheer mechanics of receiving, reporting, and shipping. This is accentuated by the constant juggling to achieve balanced stocks. Supplies on the move are available to no one—least of all the combat troops.

The second aspect may logically be included in the first, but it is sufficiently important to warrant a separate discussion. This is the time factor. The result in added cost is staggering.

Within the continental United States, a recent study indicated that the time for all items available in the system to reach the requisitioner averaged almost 6 months. Some items, of course, never did arrive; these were not included in the average. Normal order and shipping time is considered 45 days if the item is in stock at the primary source. However, a 100 percent "fill" is rarely encountered even within the continental United States.

Overseas the order and shipping time is considered 120 days. This time does not include delay in requisitioning nor time for receiving and shipping. It was also noted that it took 6 months for items available in a theater—500 miles away—to reach the troops. If we add these two together, we have the possibility of almost 1 year's delay. Logistics in the services has yet to catch up with Phineas Fogg and Passepartout and is many, many years behind Nellie Bly.

Each day of supply represents millions of dollars in inventory. Since the stockage is based upon anticipated requirements rather than usage factors, a reduction will not reduce combat efficiency, but will actually increase it. Need we comment further on the extravagance of this phase of the existing system?

Third is the added cost of preservation for long-term storage. Because of the snail's pace in the pipeline, every metal item must be preserved, wrapped, overwrapped, dipped, and anointed. For the small value item, this may run as high as 10 times the acquisition cost. Despite the initial cost, there are recurring problems of inspections and reprocessing and, particularly, repackaging.

We have no quarrel with cosmoline. What we maintain is that preservation is required for true strategic reserves—not for the pipeline. Seizing upon the old adage "For want of a nail the shoe was lost"—without careful analysis of other possible solutions to the problem—has cost untold billions of dollars.

Fourth comes obsolescence. Frequently,

the parts oozing through the pipeline arrive to greet a later model. Batteries and other items including plasma may reach the user months or years after the expiration date. This is a total loss and a frustrating experience. The gross recovery from sale as scrap seldom exceeds 5 percent of acquisition cost and when round trip and cost of handling is included, the loss is staggering—Von Steuben again.

The rate of reduction of the volume in the pipeline never approaches the reduction of major items going out of the system. The last units of Model XYZ have just been demilitarized, scrapped, or sold to the unsuspecting public. For the next 2 years, thousands of tons of parts and assemblies—some recently rebuilt and all well preserved—go into the scrap pile to be sold for 5 to 25 dollars per ton against approximately 3,000 dollars per ton acquisition cost. The acquisition cost is actually a relatively small part of the cost after several years in the pipeline.

The fifth factor is the reliance upon easier, yet far more expensive, solutions to the problem: the utilization of vast reserves of the complete unit. Within the pipeline at any given time, the standby equipment may exceed the number actually in use.

Let us assume a powerplant with three boilers normally in use and one for standby and peak loads. What type of reasoning could justify a total of seven boilers installed?

For combat operations the three spares may be justified. In the Zone of Interior at each outlet along the pipeline it cannot be condoned. Yet, we have seen reserves of this magnitude frequently established and successfully defended.

The same applies to major assemblies of military equipment. The assembly line procedure—so successful at Detroit—was never intended for the support of 500 vehicles. However, it is frequently utilized out of context—a gross waste of labor and natural resources. Five echelons of maintenance up and down can lead nowhere.

The sixth and final factor is an additional cost engendered by the pipeline when acted upon by our outstanding racial characteristic, *impatience*. Somewhere in the labyrinth of the pipeline we have misrouted a vital commodity. It does not particularly matter which one: vacuum tubes, iodine, CC pills, spark plugs, tires, or Spam.

We are out of these requisites. The troops are clamoring for them for the inner or outer man, or to repair equipment. Now let us say that the normal consumption rate is 40,000 units per month. After 3 months out of stock the demand may increase fourfold. It rises to 158,000 per month because of command pressure resulting in duplicating demands or requisitions. If we consider the broader aspects of the situation, the rate should actually have been reduced by the period the item was out of stock. Unfortunately, the machines clicking away in countless supply depots have little power of discrimination.

The net result is that eventually we have Spam coming out our ears, enough reserve iodine to paint a 20-foot strip around the Equator, or a mountain of tires or tubes. Everbody is in the act to fill a pipeline need. Before the mistake is rectified—and ordinarily it is when someone at Stock Control starts to investigate—we have not only the original items out of adjustment but many others as well.

Correction Attempts

World War I had its vast stocks of rubber boots—several pair for each man in uniform including those in Washington or training in the desert. World War II had similar examples in all the services. We all have seen classic examples; we have had this situation pointed out many times. Has the blame been placed where it belongs—at the door of the pipeline?

Within the framework of the pipeline—as it exists—various agencies in the Department of Defense have attacked the problem valiantly. They have advocated reduced inventories and use of local procurement. Eventually, all shall have a single catalogue. One agency has gone to commercial type vehicles with contract maintenance. Unfortunately, this is not considered practicable for tanks or aircraft carriers.

Call type contracts help smooth out the bulge. A project to reduce the number of parts in Army stocks has been well publicized. Complete preservation is now required only for overseas shipments. Even for overseas shipment, a recent directive permits facility pack if items are for immediate consumption. The pipeline overseas is an effective bar to this procedure 90 percent of the time.

These economies which preserve the framework of the pipeline are carefully recorded for posterity. Let us not, they say, give lipservice to economy; let us practice it. Frequently, the proposal provides cash benefits to the originator. Yet, the total net effort adds up to added cost in labor and loss of natural resources. The vested interest in the pipeline represents the major problem area.

All these efforts remind one of Bob Burns' radio story of politics in his hometown in Arkansas. One party advocated a lantern on a pile of gravel which a contractor had abandoned on the main street. The opposition party objected to the lantern because of the expense involved or for some other reason. Both would fight to the bitter end to prevent removal of the gravel pile. Are we similarly attached to the pipeline?

To illustrate the pipeline fallacy in the services, let us consider Fort Able—a military post located along the main road and 100 miles from its distribution depot, Baker. Fort Able stocks supplies on the basis of 60 days' normal stockage plus 45 days' order and shipping time—a total of 105 days of supply. Orders for replenishment must reach the distribution depot at least 30 days before the "ship to arrive by" date specified on the requisition.

The commanding officer of Distribution Depot Baker is economy minded. He can save money by consolidating into commercial truckloads, so he frequently holds shipments beyond the prescribed time limit. To compensate for this the Supply Officer at Fort Able has increased his supply level to 150 days. This saving in transportation cost is carefully reported by Distribution Depot Baker and has been instrumental in earning a citation from the Commanding General of the Army Area. If Distribution Depot Baker is out of stock, the item must be obtained from another depot and possibly the Stock Control point. This short item may reasonably be expected to arrive in from 3 to 9 months—if it ever arrives.

Now irascible Colonel Charlie, who commands Fort Able, demands *service* from his Supply Officer. So the harassed Supply Officer operates a sneak shuttle run to the distribution depot. He also hoards a few items. For example, Colonel Charlie has the only jeep on the reservation—which was at one time without a spare tire. To prevent a repetition of this catastrophe, the Supply Officer keeps four spare tires for the Colonel's jeep. The Supply Officer also holds 150 days' supply of parts for several units which train at the Post each summer—and 150 days' supply for equipment of units which no longer come but may return in the future.

Every once in a while inspectors descend upon Fort Able. Excesses are ordered back to Distribution Depot Baker. These excesses may total 1,000 to 5,000 tons. The Supply Officer is relieved or promoted—and the cycle starts over again. The situation at higher echelons of supply is a repetition on an exaggerated scale.

Just adjacent to Fort Able is a fair-size town with several automobile dealers. One dealer orders direct from his parts depot along the main road, but located 100 miles in the opposite direction from Distribution Depot Baker. He requisitions by night letter (telegram) on Tuesday; on Thursday morning the parts arrive. If the Commercial Parts Depot stocks are depleted, it telegraphs the backup point 800 miles away and those parts arrive Friday morning. In an emergency, a phone call will bring the supplies the same day. The dealer in town operates on a 10- to 15-day stock lev l. He has no problem with maintenance in storage.

If we take the example of service waste at Fort Able and multiply by thousands, we realize where our tax dollar goes. To continue along this vein can be terribly boring. However, we wish to make one more point in answer to those who say that you cannot compare business to war. What is a few dollars saved compared to a thousand lives? Is it merely a matter of giving the combat forces the same service demanded by Colonel Charlie and by the owner of a secondhand Chevrolet brought into the repair shop of the automobile dealer in the nearby town?

Supply for a future emergency is not inexhaustible. The present system failed to meet the requirement of operations such as we knew them in World War II. It is hopelessly outmoded for the type of warfare envisioned in the future. The present pipeline is not only inefficient, it is vulnerable to attack—certainly to atomic weapons. It is a luxury we cannot afford as a Nation. It may delay ultimate success and cost millions of lives.

The New Look

As the Army of the future changes in composition to meet the challenge of atomic warfare, so must logistics change. We read of pocket-size divisions, of small self-contained units equipped with all the newer atomic weapons, of cavalry of the sky for use in vertical envelopment, and of supply and evacuation by helicopter. Emphasis is on speed. Service troop strength will be reduced. These are all manifestations of the new look, the "lean and mean" philosophy.

Why has logistics not been included in this new look? Logistics needs revitalizing to fit into the new picture. Can we support this expanded effort with our corpulent pipeline, our vulnerable stockpiles, our meaningless 30 or 60 days of supply—which contain little we need—and 90 years of those items for which we have no need?

A lead editorial in the August 1954 *Combat Forces Journal* pleads for combat armies to reduce their capacity for consumption. It cites the good army, light in armor but skilled in moving rapidly, as something to think about for the future. Reduction in consumption is only part of the solution. Partisan warfare offers an object lesson to a nation which has gone so far in the opposite direction.

The pipeline as we know it must go. The stockpile must remain in piles of strategic material in the stable form, the oxide of the critical metal. These rightfully belong ahead of the factory, not between the factory and the line of departure.

Supply to the Army in the future requires minimum levels at the gun site with a constant flow from the well back in the United States. The volume must be consistent with frequent moves in either direction. It must be within the capability of available helicopters for rapid displacement on vertical envelopments.

Since rapid movement is envisioned and long supply lines inevitable, the initial resting place must be as close to the line of departure as possible. Replenishment must be by diversion of the outlet nozzle, not through vast stockpiling operations. Remember the soldiers of World

War I, forgotten after being detailed to guard the ration pile, who sent word to the unit commanding officer: "We have et up the supplies. What do we do now?"

Major General E. S. Hughes, United States Army, Ordnance, Retired, in a speech at Headquarters, Army Field Forces in the spring of 1948 admitted that considerably less than one-half of the ammunition manufactured during World War II had been expended in battle. During Korea, the author noted little reduction in total tonnage stored at one of the larger United States Ordnance depots during the entire police action. There were shortages by type but the girth of the pipeline decreased very little—if at all.

Stockpiles will be favorite targets in any all-out war. Stockpiles overseas are not only more vulnerable, but when destroyed, represent a far greater economic loss. Colonel George C. Reinhardt, writing in the September 1954 issue of *Combat Forces Journal*, states this succinctly in his plea for more tactical air support:

The farther from the source enemy material and supplies are destroyed, the greater the loss to the enemy. At the factory only the material is lost. Near the battle end of a long line of communications, destruction wastes the tremendous effort expended in getting supplies and equipment to that distant point. The blockaded army can fight while national stockpiles exist. The army interdicted by air is immediately emaciated.

Colonel Reinhardt was not speaking specifically in terms of atomic warfare. He was referring to the type of action in Korea.

What applies to the enemy certainly applies to our own supplies in an overseas theater. When we realize that in a future all-out conflict our opponents will initially enjoy air superiority, the results can be anticipated. Surely we can disperse our stockpiles by spreading them out all along the line of communications. To preserve them we shall waste more manpower and consume more supplies than this saving warrants.

General Patton was quoted to the effect that a good plan today is better than a more workable plan tomorrow. Do we need the present pipeline with its vast ancillary stockpiles? Is it an asset or a liability? How can we eliminate it? The following may be helpful.

Recommendations

1. Eliminate the stockpile complex. This is essentially a state of mind.
2. Exploit commercial counterparts down to subassemblies and parts for complex tailormade equipment. Where possible substitute the commercial vehicle, radio, or computer.
3. Examine in advance potential operational areas to ensure maximum utilization of indigenous resources, labor, facilities, and even foodstuffs.
4. Purge the pipeline of those supplies which are readily procurable at the point of consumption. Sauerkraut, cement, gypsum, hardware, and photographic supplies available in Germany, or watch movements manufactured in Switzerland should not be shipped from the Middle West to support troops stationed in Germany.
5. Separate normal flow from strategic reserve. Place greater emphasis upon rapidly increasing production than upon stockpiling. Retain such stockpiles as are deemed essential in the natural state, the stable oxide of the metal. Keep these stockpiles available at the factories, including those in standby status.
6. Calculate requirements upon *usage* rather than *stockage*.
7. Accelerate the evolution manifest by "call-type contracts" until a constant flow of parts is assured.
8. Initiate maintenance contracts with flow of parts direct from facility to testing grounds in the United States and to using troops overseas.

9. Decrease order and shipping time from months to days: 2 to 3 in continental United States, 10 to 15 for overseas; then reduce stock levels commensurate with commercial practice.

10. Eliminate the present extract system. Substitute therefor a shortage report impulse system which will ensure arrival of requisitioned items out of stock at the primary source within a reasonable period, not more than 2 days after the goods from the initial source.

11. Ensure uninterrupted flow of out of stock items from secondary sources to ultimate consumer.

12. Here we pick up the logical theme of Captain Hayes' article. Exploit airlift, CONEX containers (many small packages consigned to one customer consolidated in a larger container to eliminate repeated individual handlings), Red Ball Express, and every subsequent advance in transportation to minimize in-transit time.

Conclusion

Let us close with a word of caution. Just so long as you theorize and advocate, you tread safe ground. Practice these same ideas and you may run afoul of those who may advocate change, but who still staunchly support the status quo. The French have a word for it—in fact a proverb—along these lines.

Quite recently a distribution depot commander who had some insight into the requirements of the combat forces, instituted "1-day service." Requisitions were filled within 1 day of receipt. The customers were enthusiastic. It was duly reported with an estimate of potential savings. The estimate was 100 million dollars annually for this type of goods—a considerable amount even in these days of reckless spending.

Before any investigation, the project was vigorously denounced by one and all. Finally, the decision arrived. For the sake of brevity, we shall merely say that it was disapproved. The basis was that instead of 1-day service, it actually required over 2 days to fill requisitions, and the service prevented the economy from consolidation into truckloads. The *new* depot commander was sternly ordered to return to the old system, to ship to arrive within 30 days of receipt of requisitions.

We frankly concede that valid objections can be presented against the recommendations outlined above. To maintain a flow of supplies across an ocean and a landmass is difficult without control of the water and air lanes. But—without air superiority or even with air superiority—how can we rely on stockpiles when the location of each building, hut, or stack has been plotted to four decimal places? The choice involves a calculated risk. Unless the over-all costs, including the drain on our limited national resources, are considered, we can easily be deceived by pure sophistry.

If we must cut the defense dollar, let us cut the fat from logistics, not the muscle from the combat forces. The Nation can afford many more divisions with the money currently wasted in the pipeline. The present pipeline is inefficient. It is ineffectual. It is wasteful. It is bureaucratic. It is destructive to morale. It must be reduced to normal proportions.

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Authors submitting materials to the MILITARY REVIEW are requested to forward manuscripts through the Security Review Branch, Office of Public Information, Office Secretary of Defense, The Pentagon, Washington 25, D. C.

GOD HELPS THOSE . . .

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The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

AN IMPARTIAL observer of a court martial recently said, "The members of the court were as unprepossessing a group of colonels and lieutenant colonels as I have ever seen in one room." As a result of this comment, commanders were requested to make a conscientious effort to select court members to reflect the high standards of the Officer Corps.

Almost every service publication we read today emphasizes the importance of improving the attractiveness of a service careeer. The comment I have quoted, taken together with three other items noted during the past 2 weeks, focuses attention on an Army problem that vitally affects career attractiveness.

What should we do with incompetents and those who, although unobjectionable, give a less than average performance? If we are genuinely interested in improving career attractiveness, we may be able to accomplish more through better management of our officer promotion system than by other greater efforts to get pay and privileges that require Congressional action.

The three items noted were:

A presentation on the recent pay bill which placed great stress on the fact that an increase in pay would increase the attractiveness of a service career.

A Department of the Army Circular, dated 5 November 1954, indicating that the zone of consideration for a new selection of officers to the rank of major includes captains whose dates of rank go back as far as 1941, 1942, and 1943.

An Army announcement on 10 December of the promotion of a group of lieutenant colonels to colonels, a number of whom have been lieutenant colonels since early 1942 and have had from 20 to 25 years' service.

There is a closer relationship between the opening comment and these items, and career attractiveness than is apparent at first glance. A few remarks on each in turn will serve to highlight one of the blights on career attractiveness in the service. Correction of this blight would improve career attractiveness; it might atone for pay differentials; and it would surely solve the problem of the "unprepossessing colonels." The correction I propose is a vigorous elimination of the incompetents and steady attrition of those who, although not incompetent, are just managing to get by.

Let us consider the pay first. We are forever trying to get an increase in pay. This increase is generally justified by a comparison of the pay of men of the top brackets in the service and the salaries of leaders in civilian pursuits. What we do not recognize is that pay increases in the amount of a few hundred dollars

The first step toward improving career attractiveness within the Armed Forces is to improve ourselves. We have the mechanism to accomplish this objective if we have the heart and courage to employ it

per year are not going to have any appreciable effect in influencing the decision of topnotch young men to choose a military career, when they can look around them and see that executives in the business world who have attained positions of responsibility equivalent of those of our generals and colonels are drawing from 3 to 10 times the salary. Let us recognize that the practical limitations prevent our ever being able to exert enough decisive effect on career attractiveness through monetary means, short of another disastrous depression.

So much for the material side—the pay increase, or cash on the barrelhead approach. Now let us look at the morale or incentive side of the ledger. Consider the promotions to major. What has happened to these officers in the selection zone who were captains in 1941, 1942, and 1943? Most of those who were captains during World War II have long since become lieutenant colonels and colonels and some are even general officers. A more realistic cutoff date could have been selected which would not create the impression among young officers that a great mass of semieffectives just above them will forever block their way to promotion. Let us learn from civilian practice. In the civilian community, there are many workers who reach their maximum level and thereafter do not expect to be promoted further, but are content to serve out their working lives in positions for which they are competent. The civilian community, therefore, does not have a large number of people knocking on the door of more important management or leadership positions who have not achieved this status through demonstrated ability and against major competition.

It is a major difficulty of our promotion system that we do not recognize that an officer can reach a peak capacity beyond which he should not go. He may have the ability to be quite a good captain but if his limitations indicate that he may not be a good major or lieutenant colonel, it is absurb to promote him. However, since it costs us nothing in cold, hard cash to lift a man above his level of competence, we tend to take the easier course and promote with too much liberality. The result is a number of individuals in the field grades who cannot carry their weight and are not worth the pay they are receiving. If you question this statement, just invite some G1 who is responsible for assigning field grade officers to tell you about his difficulties in placing the large number of individuals who are "unwanted." These officers of less than average ability create many problems for the Army through poor staff work, poor command, or lack of even ordinary imagination. I do not say that they are large in number, but they do not have to be. Many of them, because of their seniority, must be placed in top leadership and management positions. The relatively small amount of deadwood lying around—especially near the top of the pile—can set enough fires so that the truly competent spend half their time acting as firemen. This condition is undoubtedly fairly well known to our members of Congress. Perhaps part of their reluctance to increase the pay of officers is a reflection of their view that many are not worth more money. If, as we went forward with a request for a pay increase,

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we could demonstrate that we are making a vigorous effort to eliminate the incompetents and to prevent those of inadequate ability from advancing in rank, we might stand a much better chance of attaining a pay increase. Regardless of the money factor, the elimination of incompetents would, by its very nature, increase career attractiveness. I have talked with several junior officers in the past year who have been trying to make the decision as to whether or not they should remain in the service. In many cases, one of the major reasons they gave for contemplating resignation was the incompetence of certain of their commanders and their feeling that they would spend years in the service under men of such poor caliber.

In recent weeks, the Army promoted many deserving lieutenant colonels to colonels. Selection to colonel was alleged to be on a "best qualified" basis. It is hard to believe that some of those on the list—considering their seniority—can be "best qualified." Some of them have been passed over in temporary and permanent selections for promotion. Surely these can hardly represent the "best qualified" when one considers the many outstanding lieutenant colonels with as much as 9 years in grade who were not even considered for promotion—let alone those in the group under consideration who were not promoted. Promotion to temporary colonel of officers who have been passed over for permanent promotion to major and lieutenant colonel is hard to justify since those temporary colonel vacancies could have been filled by officers of great promise—although with less service and experience. If all these men who have been promoted are of such competency that the commanders of their respective branches in positions of responsibility will be happy to have them assigned to their commands, I will withdraw this comment. I doubt, however, that many of those who have been passed over for permanent promotion will be sought after when positions are to be filled—and I have already seen some of this with my own eyes.

Promotion or Elimination

Everything I have said thus far relates to the tightening up of selection for promotion. What should we do about those who are not selected? Let us recognize that we have created a system where there are only two alternatives—promotion or elimination. Our selectors are confronted with a situation which, of necessity, induces great liberality. On the one hand, they can promote an officer of doubtful qualifications without any cost to themselves. On the other, if they do not promote him they must face the fact that they have separated him from his livelihood. There are plenty of situations in which a selector is justified in refusing a candidate promotion, but not in depriving him of his meal ticket.

Since we are talking about the problem of making a service career more attractive to our young men, we cannot afford to ignore any of the factors which influence them. We have all observed that the present younger generation places a great deal more emphasis on security than did the Horatio Algers of 30 years ago. This applies with as much force to those who have great potential as to those who do not. Even the youngster who is confident of his powers wants some assurance that if he is wrong about his ability to go all the way to the top he will still be permitted to go as far as his capabilities will carry him and, then, continue to earn his living at that level without being chopped off in middle life when it is too late to make a new start.

Do these ruminations lead us to any definite conclusions? I think they do. We can agree that if we did not promote so many humpty-dumpties to the higher grades we could promote men of great ability much more rapidly. We can agree further that if nonselection did not mean

elimination, the selectors could steel themselves to higher standards. Finally, we can agree that both of these policies would make a service career more attractive to a young man.

In this entire matter, I do not advocate an extreme position. It is not necessary to pass over hardworking, deserving officers in order to promote those considerably junior to them, nor to scramble the promotion list completely by dipping down and bringing relatively inexperienced officers up to high positions.

We should seek to create two conditions. First, officers of great ability should be enabled to reach positions of responsibility by the time they attain the peak of their powers. You can choose your own specifics to fit this generalization, but I suggest that our best men should become brigadier generals in their early forties. Second, promotion boards should be relieved of the pressure to promote large numbers of officers whose records show that they have done nothing bad or nothing good—but have just done nothing. This condition would be attainable if officers of limited ability were permitted to remain at a level equivalent to their competence and to serve at that level without the present opprobrium or economic disaster attached to failure to be promoted.

Deadwood and Dynamite

In past generations, we have relied on wars to correct the stultifying effect of the promotion system and it cannot be denied that they have done so very effectively. However, it is poor management to fill the river full of deadwood and then rely on dynamite to blow out the log jams. The next explosion may blow out not only the log jam but the river, too.

In order to emphasize the effect of the promotion circulars I have mentioned, let us assume that a very competent youngster, 22 years old, is trying to choose his future career. Having all the confidence of youth, he feels that he has much to offer whatever profession he selects, and he is weighing the Army against other careers. If he knows of these decisions on promotion, such as the ones discussed above, he is likely to conclude that, regardless of his ability, he cannot be promoted any faster during the first 20 or 25 years of his service than the great bulk of his contemporaries who are able—through sheer inertia—to keep from doing anything wrong. If this young man has a lot of drive and spirit—just the qualities we are looking for—I think we can safely assume that he will not select the Army as a career.

Let us revert now to the opening comments and the need for a commander to use special care in the selection of court members from among the lieutenant colonels and colonels. This should not be necessary. Court duty is one of the normal responsibilities of an officer. If any group of colonels selected at random is "unprepossessing," it is indeed a pointed comment on our promotion system. If we have not, earlier in their careers, marked those who are not competent enough and impressive enough to fill these roles, then we are in a bad way.

We can find many excuses for the existence of these conditions. We can blame them on the shortage of officer personnel, the difficulties of procurement, failure to evaluate individuals properly when making out efficiency reports, or the cumbersome administrative procedures which have been imposed on us since World War II. In spite of all these contributing factors, I think honest analysis will show a lack of adherence to sufficiently high standards by the Army. It will take moral courage to raise our sights—but moral courage should be our Army's greatest resource.

I submit that the first step toward improving career attractiveness is to improve ourselves. We have the mechanism if we have the heart and courage to use it.

Gadgets and the Man on the Ground

Major Reginald Hargreaves, *British Army, Retired*

Let nothing be allowed to obscure the fact that good Infantry is the sinews of an Army.—Maxims of Napoleon.

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

IN ALL military thinking the first essential is to hold firmly to fundamentals. However, where speculation regarding the military "shape of things to come" is concerned, soaring imagination, inflated by the thought of new inventions and techniques, so easily takes wing that it becomes a matter of some difficulty to keep both feet planted firmly on the ground. This applies particularly to the "specialists," anxious to exploit some newfangled military gadget in which they have a psychological vested interest.

In the type of warfare with which the world would be likely to find itself confronted in the near future, the paramount desire among the non-Communist belligerents would be for a speedy victory, at the minimum cost in lives, treasure, and material resources. It follows that in trying to weigh the requirements for future conflict, a fatal tendency arises to seek for some pushbutton device, some apparently easy way out, that will save life by absolving the fighting man from all but a modicum of fighting.

It is this comprehensible, but shallow-minded, desire to win war on bargain basement terms that ensures for the gadgetmonger an uncritical attention and eager credence out of all proportion to the value of the particular contrivance he happens to be championing. In the outcome, wishful thinking and sanguine assurance combine to create an atmosphere in which it is extremely difficult to hold to the blunt, hard fact that, with opponents of anything like equal strength, there are no shortcuts to victory. However ingenious and promising the latest device for abbreviating conflict, in the long run the chances are that it will turn out to be just another means of prolonging it.

War had its origin in the first attempt by a prehistoric tribe to "claim jump" a neighbor's better-stocked hunting grounds. The venture was strictly an infantry enterprise; and with warfare's expansion every device evolved by human ingenuity has been designed to aid, or impede, the work of the infantryman. More often than not, the intention has been to try and obstruct him; a fact which attests to the transcendent importance attached to the foot soldier's activities.

Time was when the Infantry went to work without any preliminary bombardment, for the simple reason that no gadgets in the way of cannon had yet been invented to lay down a protective barrage. Time was when the Infantry went to grips

It is the enemy rifleman, not the gadget, who is the main concern of our infantryman. It is his sober realization of this fact upon which the entire fate of the Western World may someday come to depend

without having to wait until the tanks had (theoretically) broken a way through for it; and this for the excellent reason that the tank, even in the elementary form of the Hussite war cart, had yet to make its appearance. Time was when the Infantry closed with its adversaries without waiting for the dive bombers to soften them up in order that tanks could break through so that the "footsloggers" could wade in.

Delaying the inevitable—it boils down to very little more. Without the Infantry, the supporting arms—helpful as their time-consuming activities have become—would be entirely without purpose, and quite incapable, incidentally, of achieving victory in their own right. It is the cutting edge of the sword that strikes home. The "pommel," the "grip," the "guard," the "*quillons*" and the "fuller"—all go to furnish forth the weapon. However, it is the "forte" and the "foible," the cutting edge, that gives the blade its usefulness, its power of impact. It is as the cutting edge of the sword that the Infantry functions, and always will.

The history of war is the story of the deterrents that have been devised to impede the infantryman in the execution of his task. It is no less the chronicle of the footslogger's consistent success in surmounting all the obstacles with which ingenuity has sought to default him of his predominance on the battlefield.

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Alexander's Infantry

In 492 B. C., for example, the two great military powers of Greece and Persia embarked on a life and death struggle in which victory or enslavement were the alternatives with which the former found itself confronted. For over half a century, the Greeks fought valiantly to maintain their freedom. However, their success in the Battle of Marathon and the great sea encounter of Salamis still left the issue undetermined; although again and again they had demonstrated their superiority in close combat.

When Alexander succeeded to power on the assassination of his father—Philip of Macedon—he found himself in command of a powerful army, in which the Infantry was by far the most formidable element. With this splendid force of 30,000 seasoned foot troops and 5,000 horse troops at his heels, the youthful monarch crossed into enemy territory to find himself confronted by Darius, the Persian King, at the head of a host half a million strong.

The first encounter was at Issus—on the plains of Syria—where Alexander, retrieving an initial tactical blunder, outmaneuvered his opponent and, with the heavy Infantry of the phalanx, beat in the flank of picked Persian troops of the center. Darius fled in panic; and it was not until he had put the Euphrates River between him and the victorious Greeks that he started to reorganize for a counteroffensive.

Mustering another horde of half a million men, Darius awaited the advance of his adversary at Gaugamela (Arbela). He had prepared a surprise for the terrible hoplites of the phalanx, in the shape of bronze-armored chariots with stout scythe-blades protruding from either side. In the Persian's boastful words, these war cars would slice the enemy phalanx into gobbets; and the remnants of the demoralized and scattered formation would fall

easy prey to his fleetly moving horse troops.

However, Alexander perceived his danger at once; and since his foot troops were divided into the heavy Infantry of the phalanx and lighter troops—or hypaspists—armed with bows, slings, and throwing spears, he sent forward the latter to take the chariot charge in flank as it gathered speed.

Amid a hail of arrows, darts, and javelins, the charioteers sought desperately to keep formation and maintain their impetus. However, so many of their horses had been brought low that the entire forward movement piled up in a bloody tangle of interlocked wheels and frantic steeds, lashing out amid the scythe-blades that lacerated them the more cruelly the more furiously they struggled.

The device upon which Darius had counted to countervail against the enemy Infantry had failed. Since he had no other resource to fall back upon, the phalanx moved steadily and inexorably forward to turn an armed host into a swarm of gibbering refugees, to be dealt with by Alexander's Cavalry at its leisure. A tactical "surprise" based on a novel mechanical device had failed to turn aside the sweep of the infantryman's sword and, as always, its keen edge had prevailed.

Caesar's Infantry

In 56 B. C., Gaius Julius Caesar made his first bid at the conquest of Great Britain; repeating the venture in greater force the following year. With the men of the 7th and 10th Legions at the head of his invading troops, the Roman Commander anticipated little serious trouble from the swarm of wild tribesmen, who would fight under all the disadvantages that attend on lack of expert military training and the absence of a proper tactical doctrine.

However, the tribesmen had perfected one tactical "surprise" which for a brief moment threatened to prove the invaders' undoing. Hitherto the Legionaries had made no acquaintance with the Britons' war chariots; more rudely fashioned than those of Darius, but furnished with similar menacing scythe-blades. Moreover, the Britons' tactical employment of them was on entirely different lines to anything the Romans had been told about by their military chroniclers. With the invasion force advancing inland in column of route, the chariots, containing six warriors in addition to the driver, would be raced furiously along the ranks, seeking everywhere for a gap, for a chance to "break the line" and wreak as much damage as possible before sheering off to repeat the maneuver further down the marching throng.

For a time these chariot combat teams, darting out of concealment, wrought considerable mischief. However, a hastily improvised drill—which confronted the advancing war cart with a "hedgehog" of bristling javelins—soon put a very different complexion on affairs. For although the 7-foot, 12-pound javelin was primarily intended to be thrown—as a missile weapon—and ranked with others in an impenetrable *chevaux-de-frise*, it served to "prop off" the careering charioteers as effectively as the hedge of British bayonets held off Napoleon's Cavalry on the field of Waterloo. At the same time, certain men in the ranks, especially detailed for the task, would stoop under the shelter of their shields and hamstring the horses with their short double-edged swords.

Yet, once again, the validity of a fundamental axiom had been given striking emphasis—that once a surprise gadget or device has lost its novelty, infantry tactics can always be adjusted to deal with it effectively.

Long before they conquered Ancient Briton, the Romans had met and learned to deal with a surprise device of quite unusual characteristics. In 281 B. C.,

the Legions had found themselves confronted with the army commanded by Pyrrhus—King of Epirus—and in the forefront of his battle array had been ranged a new form of "storm troops" that took the shape of elephants. At first, the effect of these huge beasts charging into the cohorts' ranks was devastating. The Legionaries were quite at a loss how best to deal with them, and, therefore, prone to flinch and scatter—although the invaders' own losses in the Battle of Heraclea were so heavy that to this day the term "Pyrrhic victory" is employed to denote a success in which the debits are out of all proportion to the gains. However, it was not long before the Legionaries devised a method of tactical defense to deal with this strange new element of the battlefield. At the encounter of Beneventum, the elephant charge was entirely disrupted when specially selected men darted in to hamstring the lumbering beasts, while others waved flaming brands before them until they turned and stampeded back toward their own lines—to trample the ranks of the very men who were pressing forward to exploit a repetition of their earlier success.

In the great struggle between Rome and Carthage, Hannibal, the leader of the Carthaginian host, also employed elephants against the cohorts of the Legion. However, his paralyzing victories were less attributable to the presence of these monstrous descendants of the mastodon than to the deterioration in the quality of the Roman Infantry and the feeble, vacillating system of command. It was not until the brilliant, resolute Scipio Africanus had revitalized the Legionaries' fighting spirit that the tables were turned, at the Battle of Zama, and a defeated Carthage was humbled in the dust.

It was lack of the proper tactical doctrine, to deal with another new element in warfare, which led to the overthrow and death of the Roman Emperor, Valens, at the Battle of Hadrianopolis in 378 A. D. The Roman leaders had always relied—and rightly—upon their indomitable foot troops but they had done so to the dangerous neglect of the Cavalry and other supporting arms. This lack of balance in the Roman forces was spared the usual penalties visited upon military imperception so long as they were confronted by opponents who placed equally preponderant emphasis on their own Infantry.

It was a very different story, however, when, on a broiling day in August 378, Valens rushed forth from the city of Hadrianopolis to seek out the Gothic hosts of Fritigern. In no respects was it a day which saw the Romans at their best. Their approach march was so ill-timed that the right wing arrived in sight of the enemy while the center and left were still some distance to the rear. The result was that the laggards arrived on the scene of action blown and flustered; and a good deal of confusion accompanied the forming of the battleline.

The Gothic foot troops were concentrated in a laager of wagons, and the Legionaries resolutely advanced on this improvised stronghold, determined to block all avenues of escape and put every one of the defenders to the sword. The fight was raging hotly all along the barricade of tumbrels when suddenly a vast and hitherto concealed cloud of horsemen charged into the Roman left. It was the main body of the flying squadrons of Alatheus and Safrax, and it fell on the Legionaries' exposed flank "like a thunderbolt which strikes on a mountaintop, and dashes away all that stands in its path."

For this kind of torrential assault by Cavalry, the Legionaries were entirely untrained and, therefore, unprepared; through neglect to work out a thoroughgoing tactical doctrine for their own horse troops, they found themselves helpless in the face of an admirably conceived and oft-practiced attack by a well-mounted foe.

With Valens and most of his principal subordinates struck down, the Legionaries, scattered and demoralized, were "like ripe corn for the sickle"; and the day ended with 40,000 of them stretched in death on the open plain.

Neglect of another fundamental, to train men for the *next* war rather than the last, had brought a proud Infantry to humiliation and disaster.

Rise and Fall of Cavalry

Hadrianopolis marked the beginning of a period, lasting over 900 years, throughout which the Cavalry remained the arbiter of the battlefield. In the military forces that emerged from the blight which descended on the world with the fall of Rome, the armored knight lorded it over a "rabble of foot troops" who found it virtually beyond its power to do him injury. Chain mail and armor plate were the gadgets whose powers of resistance the infantryman found it almost impossible to overcome. To thrust a bill or halberd at a man encased from head to foot in steel was about as useful as trying to pierce a lobster with a toothpick.

Then in 1282 A. D., the English King Edward I returned from a punitive expedition to the Welsh Marches with a very healthy respect for the prowess of the hostile bowmen with whom he had recently been in contact. As he was quick to perceive, here was a missile weapon whose steel-tipped shaft, if properly sped, would provide an answer to the lordly and hitherto imperforable knight in armor.

The Battles of Crécy (1346 A. D.) and Poitiers (1356 A. D.) speedily demonstrated that no Cavalry, however snugly sheathed in metal, could stand up to the missile weapon which, in one fell swoop, had restored the Infantry to the proud position of the Queen of the Battle.

However, it was not long before another device of war emerged, whose steadily progressive employment was to exert the most far-reaching influence on all the infantryman's future activities. About 1254, Roger Bacon had hit upon the compound that came to be known as gunpowder; and within 50 years of its discovery, its application to military purposes was well under way.

However, so far as the infantryman was concerned, the introduction of the handgun, or harquebus, into warfare proved at the outset rather a handicap than an advantage. To begin with, the weapon itself was so heavy and unwieldy that it required a steel-shod rest, rammed into the ground, to support the barrel. Then the process of firing the piece—in which, as Stow informs us, "the musketier takes down his musket, uncockes the matche, blowes, proynes, shuttes, castes off the pan, castes about the musket, opens his charges, chargeth, drawes out his skowring sticke, rammes in the powder, drawes out again, puts up the skowring sticke, lays the musket on the rest, blowes of the matche, cockes and tryes it, gardes the pan, and so makes ready"—took such an unconscionable time that three or more pikemen had to be detailed to guard the harquebusier in the lengthy interval between shots. As a consequence, a dichotomy arose which separated the Infantry into two elements—offensive and defensive.

In the outcome, deadly as were the injuries wrought by the contemporary 1¼-ounce bullet, the inordinately slow rate of fire and the many accidental explosions occasioned by the smoldering match, militated heavily against the usefulness of the musket as an aid to infantry fighting. It was not until the matchlock and its derivative, the wheel lock, had been replaced by the more reliable flintlock, that an efficient gunpowder-charged weapon restored the infantryman to that dominating position on the battlefield he had held so often in the past, and will continue to hold in any foreseeable future.

With gunpowder, the first of the chemical propellents, the world had passed into the technological epoch of war; and valor had become useless unless supported by the products of the mechanician's art, of which the most versatile, as well as one of the most powerful, had been placed in the hands of the foot troops. For when the firearm became fitted with a bayonet, the infantryman was presented with a weapon which combined missile action and a means of closing with the enemy that was virtually without parallel. Artillery was useful in sieges, of course, and could support the footslogger in battle; Cavalry was always effective against broken Infantry and occasionally could drive home a useful charge from the flank. However, as the firearm became progressively more accurate of aim and speedy of discharge, the tendency was to train the *arme blanche* as a unit of firepower capable, into the bargain, and should the rare occasion offer, of shock action on traditional lines.

Trench Warfare

As was only to be expected, the defense continued with increasing zeal to try out devices designed to minimize the effect of the infantry's fire and impede its assault with the cold steel; first that of the musketeer's alter ego, the pikeman, and then that of the linesman whose firearm had been furnished with a bayonet. In 1522, for example, at the Battle of La Bicocca, the Marquis of Pescara concentrated his musketeers in a sunken road, the banks of which afforded his marksmen considerable protection: and the era of the trench, the rifle pit, and the foxhole was inaugurated. It was an action, moreover, which hastened the arrival of the bayonet, since it was made plain that something less cumbersome and unwieldy than a 7- or 8-foot pike was required to remove men ensconced in deep entrenchments.

Then there were such surface obstructions as abatis of interlocking tree trunks and branches—such as those which so seriously held up the advance of the Black Watch (42d Highlanders) at Ticonderoga in July 1758. To this device can be traced the genesis of the knife rest and barbed wire entanglement, by way of the sangar of the North-West Frontier of India and the thorn-scrub zareba which played so prominent a part in Kitchener's Omdurman Campaign of 1898. The countermeasures to overcome these obstructions extend from the introduction of the bearded pioneer with his leather apron and gleaming ax, who clove a way through all obstacles by sheer brawn, on to the rolling barrage of later warfare. In the general sense there gradually emerged a tactical doctrine for the infantryman which was summed up by General George Patton, in his well-known recommendation to "Hold your enemy by the nose with fire, and kick him in the pants with movement."

World War I saw the progressive strengthening of obstructive defenses on such a scale that it can only be termed stupendous. After the Battle of the Marne, two armies swayed to a standstill in absolute deadlock, as the retreating Germans rounded to confront the pursuit that panted on their heels. With tremendous energy, both sides sought to deepen and expand the sketchy system of shallow trenches and unconnected rifle pits into which they had flung themselves overnight, when war of movement had modulated into war of position. Steadily and surely a system of field fortifications came into being, on both sides of no man's land, which possessed much of the solidarity of permanent works, while covering a considerably greater area in depth, and boasting virtually uninterrupted continuity. Defended by machinegun posts, strong points, mortars, barbed wire, and the musketry of their garrisons, they were given additional strength by Artillery in close support. In the outcome they became so inviolable, so terribly difficult and costly

to assault, that their impenetrability threatened to bring about a condition of permanent stalemate.

Something had to be done to permit the Infantry to approach its opponents in sufficient strength to impose its will upon them by its superiority in close fighting. The Germans were the first to think of a device that promised to further this purpose; and on 22 April 1915, they launched an attack at Ypres which was heralded by a cloud of poison gas. Chemistry was the gadget, *the obstacle to the action of the defense*, which was to make a way for the infantry assault it was unable to secure without aid. In this case, it only added to the confusion—and the casualties—of the general action which ensued. For the best elements among the Allied troops, recovering with exemplary swiftness from the momentary demoralization which the surprise of this new addition to the armory had created, charged *through* the gas cloud to engage the enemy in the untainted region beyond it.

Thereafter, gas warfare could pretend to little more than nuisance value. Its discharge from containers from the shelter of a trench at an opposing line was of very limited effect, once both sides had been furnished with adequate gas masks. Moreover, a sudden shift in the wind might well cause it to recoil on the very positions from which it had been projected. Sprayed over back areas and gunsites in the form of gas shells, it might catch and immobilize a few of the casual and unwary, but it did little to impede those well grounded in "gas drill" and accustomed to going about their work subjected to the relatively slight inconvenience attendant on wearing a gas mask. In effect, once its surprise value had been discounted and adequate measures taken to counter its effect, its usefulness as an obstacle to the advance of resolute Infantry was virtually nil.

The same may be said of the *flammenwerfer*, or flamethrower, so long as it continued to be manhandled. With its first appearance, its unusual qualities as a weapon gained a certain surprise success for it. It was soon found, however, that if the troops against whom it was directed took cover in the bottom of their trenches, so that the stream of flame—which tended naturally to rise—passed over their heads, a marksman away on the flank could easily pick off the man carrying the container and projector, and with his collapse the device went out of action.

The Tank

Barbed wire, on knife rests and posts, in elaborate "aprons," or in loose rolls, having proved an obstacle on which artillery fire, mortars, and the bangalore torpedo could wreak no more than superficial damage, the Infantry sought to tackle it with hand-manipulated secateurs. However, this was a deadly slow process, and carried out in the open under concentrated machinegun and rifle fire as it was, it proved all too costly in casualties. Something that was impervious to small arms fire was what was needed to crush a way through the wire obstacle and make a way for the infantrymen's advance. The answer took the form of that lumbering armored mastodon which was given the code name of "tank" by which it is still called.

The first appearance of this remarkable gadget undoubtedly had a profoundly demoralizing effect on the Germans to whom it came as a complete surprise. The author recalls that on 15 September 1916, the day of the tank's first appearance in action, entire groups of the enemy spilled out of their deep-dug defenses and came forward with their hands up in token of submission—and the German does not surrender easily. Indeed, something of the measure of their consternation can be gauged by the jawbreaking name they

first bestowed on the dreaded tank—*Schutzengrabenvernichtigungsautomobil.*

In 1917, the massed tank attack at Cambrai proved a highly successful stroke which, had it been properly exploited, might well have led to a resounding victory. For, at that time, no real answer to the problem presented by the tank had yet been evolved. However, before the end of the campaign, the Germans had evolved a heavy antitank rifle, which clearly presaged the antitank guns of later days; gadgets which in due course were to relegate the tank to the role of just another adjunct to infantry fighting.

It is not without significance, incidentally, that Ludendorff's last and temporarily successful throw, in March 1918, was executed by Infantry *solus;* and was eventually halted by Infantry without noticeable benefit of tanks.

In 1940, Hitler's factory-fashioned blitzkrieg succeeded because the measures necessary to counter it were imperfectly understood and even more imperfectly put in train. Even to the last, the French were thinking in terms of linear defense; it was the Weygand *line* when the entire situation cried aloud for defense in depth.

Not so very long after, at the Battle of El Alamein, the wheel came full circle, and the world was indulged in the spectacle of the Infantry actually nursing the tanks into action. Thereafter, it was found that the pestilential obstacle of minefields was far better dealt with by Engineer units and properly trained teams from the Infantry, than by tanks trying to negotiate them with the help of such adventitious attachments as flails and similar devices, designed to explode the mine well ahead of the advancing armored fighting vehicles.

With the Normandy Campaign, it was the footslogger who had personally to clear the bocage country step by step, while the tanks were engaged in a process of mutual extermination elsewhere. With regard to the later stages of the struggle, while admiration must not be withheld from General Patton's spectacular drive across country with his armored "cavalry," it has equally to be borne in mind that it was an infantry unit that made the first momentous crossing of the Rhine at Remagen.

A very senior officer once pronounced to the author, "All wars end in the same way; two men in a ditch, and one of 'em comes out alive." Allowing for a certain oversimplification, the truth of this terse dictum can scarcely be gainsaid. When the ground has been cleared of all the tricksy devices by which both sides have sought to spring a surprise or gain advantage over each other, what is left? It is the infantryman, and those comrades of the immediate supporting arms upon whom he relies for his closeup backing—field gunners, mortar men, sappers, and the like, who may fairly be said to form an essential and integral part of the infantry combat team.

They constitute the cutting edge with which the job must be finished; and it is only by their carefully co-ordinated efforts that it ever can be finished. One of the fundamentals of war that is far too often overlooked is, that while an enemy position can be demolished by air strike or long-range missile action, it can only be taken and held by Infantry. If it is not so taken and held, there is nothing to prevent its reoccupation by the foe. Then all is to be done again.

The Future

So far as future conflict is concerned, it is a moral certainty that the brunt of the real work will continue to fall on the infantryman.

Presupposing the use of tactical atomic weapons on both sides, it becomes necessary to envisage a battle area approximately 200 miles deep. Dispersion and concealment will be the dual necessities of the day. Yet, once the welter of fac-

tory-made gadgets has succeeded in mutually eliminating each other and a momentary superiority has been gained by the use of tactically employed atomic warheads, no time dare be lost in turning that superiority to full advantage. With everything pulled back out of reach of atomic field weapons, it is obvious that any heavy tank formation would be far too remote from the temporarily disrupted enemy combat zone for them to arrive on the scene in time to make the most of the fleeting opportunity presented. Only Infantry, lifted from the periphery of the battle area—where it will have been safe from hostile interference—and flown in by "planes and gliders," could be brought to the point of decisive action with such speed as fully to profit by the brief phase of demoralization the enemy would be bound to experience during the immediate aftermath following a concentrated "shoot" with atomic missiles. Indeed, in the interest of speedy exploitation it might well prove necessary to drop parachute combat teams right on the heels of the "big bang," with gliderborne elements acting as their immediate supports. Naturally, both parachute and gliderborne troops would be formed as complete combat teams, with a full complement of supporting arms, up to and including light tanks and field guns—and in due course the convertiplane should come to be their means of transport.

With local victory ensured by the speediest possible action, the rest of the buildup would proceed on normal lines.

It will be perceived that in this glimpse of the possible "shape of things to come," the Infantry, with its immediate supports, will be, as always, right in the forefront of the fray—"the first in and the last out," as is their proud tradition.

That the infantryman must ever regard this onerous responsibility as his own peculiar obligation, may be accepted as another of the prime fundamentals of warfare. Moreover, he must learn to fight his battles without too much thought of the heavier supporting arms that are there, when opportunity offers, to back him. When the foot soldier starts to look over his shoulder, his quality has seriously deteriorated. Napoleon once observed that a too numerous Artillery was a sure sign of a weak and irresolute Infantry. By the same token, too great a reliance placed on gadgets, on specious but gimcrack alleged shortcuts to victory, can only have the effect of weakening the spiritual fiber and whittling away that toughness of morale upon which victory ultimately depends. As Armand du Picq so emphatically affirmed, "Man is the first weapon of battle" and in emphasizing this it is obvious that the writer had the infantryman primarily in mind. Provided the footslogger is properly indoctrinated about the latest gadgets—atomic or hydrogenic; realizes what they *can* do and what they *cannot*; and appreciates that like all gadgets, at all times, they can only play the *overture* to the *opera* that he alone can perform; then he will see things in their right perspective, and will come out right on top, as heretofore.

It is less the gadgets and contrivances with which he is supported than the enemy rifleman in his front that constitutes the footslogger's main concern. It is upon his sober realization of this unyielding fact that the entire fate of the Western World may someday come to depend.

"SQUEEZE 'EM AN' BLAST 'EM"

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The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

THE once unusual, but now familiar, mushroom cloud arising from Hiroshima on 6 August 1945 was really a challenge to the Officer Corps of the United States Army. Had that cloud been able to speak it no doubt would have remarked, "Gentlemen of the Army, awake. A new era for your breed is at hand calling for completely new doctrine, tactics, techniques, and not a mere rehash of the old thinking." The cloud could have spoken no further for it was not Benning, Knox, Sill, Bliss, or Leavenworth trained. However, we must accept its challenge—"Not a mere rehash of the old thinking but new. . . ." Let us examine the challenge—objectively, subjectively, and critically.

Objectively, we can know more about the challenge than ever before if we so desire. Why? Because at last there is an excellent, unclassified reference available to the entire Officer Corps—Department of the Army Pamphlet 39-1, *Tactical Use of Atomic Weapons (Unclassified Military Effects)*, March 1955 which was prepared at the Command and General Staff College. This document covers such subjects as atomic weapon effects, assumed atomic weapons and delivery systems, effect radii for the assumed atomic weapons, residual radiation, casualty and damage estimation, troop safety, and selection of weapons and delivery means. While it is true that much of the information is assumed, it teaches procedures and principles. It enables us to reduce, materially, the amount of classified material that must be kept for reference. However, because of the problem of classification and multi and piecemeal documentation, the best means of obtaining a satisfactory intrinsic evaluation of atomic weapons quickly is to attend an orientation course at the Antiaircraft Artillery and Guided Missile Center, Fort Bliss, Texas, or at Sandia Base, New Mexico.

In examining the challenge subjectively, we must apply the intrinsic knowledge against existing doctrine, tactics, and techniques and evolve an integrated new concept. The basic question before the reader is to satisfy himself whether this technique and doctrine is not merely an adaptation of a new—the atomic—weapon into preconceived concepts or have the authors shaken all the pieces up, poured them out, and evolved a completely new concept? We will find, by using the shaking up, pouring out, and evolving method, that many old truths remain, many others remain but must be modified—still others not only no longer apply, but are dangerous to retain. In making such an evaluation, we must consider such factors as the effect of special weapons upon the doctrine of fire and maneuver, upon the tactical principle of seizing key terrain to ensure the victory, and upon our basic battalion, regimental (combat command), division, corps, and field army concepts of tactical employment with their accompanying concepts of communication, control, and logistical support.

Fire and maneuver has been a factor in war since the appearance of the sling and stone. Until 6 August 1945, the emphasis was on using fire to facilitate maneuver. Since no special weapons were

employed in Korea, we can consider the Korean experience as an extension of World War II experience. During 1951, the "Van Fleet" day of fire became a term to compete with the more conservative expenditures shown in Field Manual 101-10, *Organization, Technical, and Logistical Data*, 8 July 1953. It signified the concept of stressing volume of fire to smother the enemy defenders while our maneuvering force closed on its objective. In World Wars I and II, the Germans maintained that the United States Army concentrated such overwhelming superiority of fire on them that it made an American defeat impossible. This is our military heritage and was initially conceived by General Ulysses S. Grant in front of Petersburg in 1864. As a result, we have stressed the "fire" aspect of "fire and maneuver" since 1864, in contrast to the Confederate and German Armies who won their victories by "maneuver and fire"—with maneuver predominating. Chancellorsville and Tannenberg contrasted to Cold Harbor, Petersburg, and the St. Lô breakthrough illustrate the difference in the two concepts.

An extension of the emphasis on fire by our Army is to modify the principle of "fire and maneuver" to "fire, maneuver and fire." This new principle would be designed to obtain the maximum benefit from special weapons. For ease of illustration, let us call it the principle of "fire one, maneuver, and fire two." We use "fire one" to express the concept of the "Van Fleet" day of fire which implies pulverizing the enemy with such a volume of fire that he is helpless to resist until this fire lifts. Under cover of this saturation fire, our maneuvering force can close on its objective with a minimum of casualties.

At Cannae in 216 B. C., Hannibal's objective was simple—to destroy the Roman Army under Varro. He accomplished it by maneuvering the Romans into a tight, compact, and surrounded mass—compact to the degree that the individual Romans were so crowded that they were unable to use their swords effectively. From that point on it became merely a matter of slaughtering the helpless Romans.

Our doctrine has always reflected Forrest's "get thar furstest with the mostest." This doctrine implies a stronger concentration at the point of attack than the enemy. Yet, we now are faced with the necessity of remaining widely dispersed to avoid excessive losses from enemy atomic weapons. How then can we "get thar furstest with the mostest"? One means is by utilizing highly mobile forces. Yet, are these forces not subject to fire by enemy atomic weapons when they concentrate? A possible solution exists in the concentric concentration on the battlefield as contrasted to the concentration in an area prior to launching the attack. The elder Von Moltke's victory at Sadowa (Koeniggratz) in 1866 is an outstanding example of concentration on the battlefield rather than in an assembly area prior to the battle. It requires highly trained staffs, disciplined troops, and split second timing to avoid defeat in detail. However, this may be the pattern of the attack of tomorrow. The Battle of Sadowa should be carefully studied and evaluated by War College students.

A critical analysis of the challenge of the mushroom cloud reveals that we must change our old thinking and consider new doctrine, tactics, techniques, and strategy as a continuing operational process

The technique of maneuver must be modified. There will be no place in a 2-sided atomic war for the World War II "coil and strike" technique of fighting an armored division. It is ironic that the march column—the most vulnerable for-

mation to conventional air attack—is the safest formation for protection against atomic attack. The attack from multiple march columns will replace the former coil and strike concept. For infantry units, as well as armored units, the assembly area and attack position method of concentrating in the face of the enemy to co-ordinate an attack must be relegated to history. This will require infantry to be mobile and capable of the rapid reactions and close timing that have always characterized employment of armor. What was formerly considered to be a special operation—advance guard action from a march column—may well be the technique of maneuver in the future.

Decisive engagements will consist of a series of company and battalion size fights over a wide area—placing the responsibility for victory on the much harassed junior officer. Ground combat will be a captain's and, to a lesser extent, a lieutenant colonel's war. It would be a boon if these ranks were given an opportunity—and the lieutenants who will be in these ranks when it comes—to develop during normal peacetime duty and training, and were given an opportunity to act and think for themselves. Initiative in junior officers is not developed by breathing down their necks constantly during normal peacetime service. A captain's war is won by captains; not by inspectors from higher headquarters and by rigid adherence to fixed routines established by some senior commander. Much could be written on this point.

So far, we have considered "fire one," as illustrated by the "Van Fleet" day of fire, and "maneuver," as illustrated by Hannibal at Cannae and Moltke at Sadowa. The next part of the new principle to consider is "fire two." When Hannibal maneuvered the Romans into the compact, surrounded, unmaneuverable mass, he began the slaughter with swords, spears, and like weapons. When we have maneuvered and compressed our enemy into position for the kill, we can employ "fire two" by hitting him with a special weapon or a concentration of special weapons to complete the slaughter or to destroy his ability to continue the fight. Reducing the new concept to its lowest terms: "fire one" to enable us to maneuver; then "maneuver" to force the enemy into a small area or killing ground; and "fire two" to destroy him. The concept is illustrated on page 59. This can be termed the "squeeze and blast" concept. Like all principles, it must be applied flexibly. There will be situations where "fire one and maneuver" may accomplish the desired result; or we may be lucky enough to force the enemy to adopt formations or to concentrate where "fire two" alone will obtain our ends.

The "squeeze and blast" concept can be employed by any commander, regardless of the size of his unit. A low yield weapon may eliminate an enemy force opposing one of our battalions after the enemy has been squeezed. The higher the echelon the bigger is the boom or series of booms required to destroy the opposition. However, the principle remains constant. After that bodacious old man, General "Jube" A. Early, bearded the Yankees in their Washington den in July 1864, Grant sent Sheridan to the Valley of Virginia with very simple instructions: "Find Early and follow him to the death."

The principle of the objective naturally

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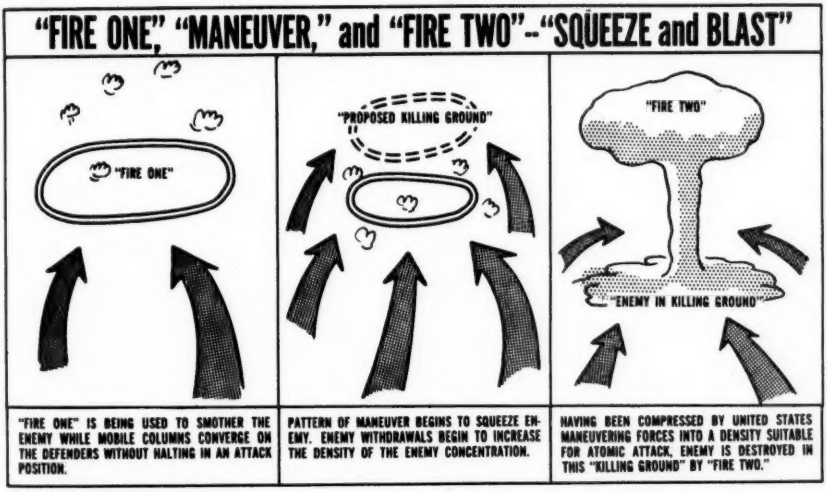
will remain constant, but, especially in a 2-sided atomic war, the factors considered in selecting this objective may require modification. This applies from the battalion on up through the field army level. We must select our objectives to enable us to follow our enemy to his death whether we use the "fire one and maneuver" or "fire one, maneuver, and fire two" system. Re-evaluation of our past use of the principle of the objective reveals a great desire to capture big name

too, can use our capabilities to offset certain superiorities of our opponents.

Consider a situation in which the enemy has large, heavily armored and mobile forces greatly outnumbering our mobile armored forces. If we and the enemy both possess a special weapons capability, our atomic capability will be the "Pass at Thermopylae" which prevents the enemy from being able to mass his preponderance of mobile forces against us. If he does mass them, we can destroy them or



places, which many times meant absolutely nothing tactically.

Genghis, the Great Khan, stressed the principle of "divide and conquer." He taught his Noyons that it was far easier to gobble up a large enemy in small bites than all in one big bite. Genghis also stressed the principle of using the enemy's strength as a weapon against him. The highly mobile Mongols, under Subotai, slaughtered the more heavily armed and armored Europeans on the Sajo, in 1242, by using their mobility and deception to turn the enemy's superiority in armor and weapons into a Mongol advantage. We, whittle them down with our special weapons. This gives us the capability of reducing the size of the force that can be concentrated against us at any one time; but it does not remove the possibility of an enemy victory by attrition. In order to avoid defeat by attrition, we must develop the capability to launch effective offensives that will enable us to follow the enemy to his death, not ours. The "squeeze and blast" concept is a method.

A critical analysis of the challenge presented by the mushroom cloud can be extremely revealing. One of our scientists has stated that "the greatest hindrance

in developing a satisfactory doctrine for tactical employment of atomic weapons are the highly successful battalion commanders of World War II." This may sound like an indictment of some of our most brilliant officers—but is it? We can take a new second lieutenant with no experience whatsoever and instill in him any tactical concept that we desire since he has no experience to draw upon that would enable him to analyze those concepts extrinsically. What is the status of the highly successful battalion commander of World War II? This man has considerable tactical knowledge. As a brilliant individual, he evaluates new concepts and relates them to his experience. Furthermore, most of these World War II battalion commanders are now senior commanders or staff officers in key positions where they wield considerable influence over our doctrine. We cannot expect these men to fail to examine the challenge of the mushroom cloud extrinsically—woe unto us if they did not. However, we do expect this analysis to be of the type where their successful past is considered along with new developments to produce a completely new concept that considers all aspects of the problem and does not merely integrate each new development into an old—World War II—pattern on a shotgun or patchwork basis. Any brilliant World War II battalion commander will do this automatically. The pseudogreats may not.

Where are the weak spots in our doctrine. Certainly it would be inadvisable to air them for a potential enemy, but we can apply three factors against our current doctrine and see how it stacks up. First, *is it simple*? Is it so designed that there are simplified versions available at the various echelons of headquarters based on providing working guidance for each level commander on a "need-to-know"—really a "must know"—basis? Can the people who must implement it understand it? Will it work? Can a frontline battalion commander request and receive an atomic strike in a period of time which will not merely result in a lost opportunity? Is it sufficiently and simply documented so that officers can study it without having to become part of a school quota?

Second, *is it realistic*? Does it face all the facts and give an appropriate and workable solution? Is is based on antiquated principles with shotgun inserts of thought?

Third, *is it overclassified*? Have we kept so much of our doctrine in the higher classification levels that *Time* Magazine is a better source of information to the average officer than an accessible official manual? Is there any reason for not unclassifying certain portions of it? Will publication of an unclassified text provide a potential enemy with any information he does not already possess?

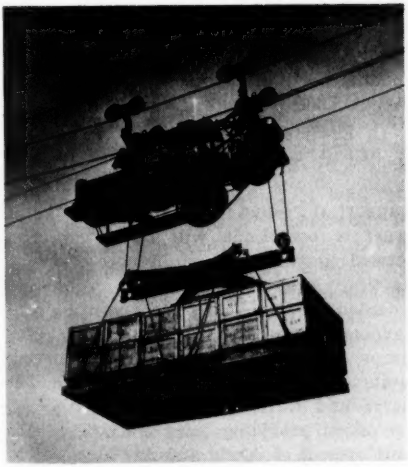
Utilizing the index numbers of General Semantics as an evaluation aid, we know that war 1955 would not be the same as war 1945 since weapons 1955 will not be the same as weapons 1945. We also know that enemy 1955 would not be enemy 1945. Since factors 1955 are considerably different from factors 1945, doctrine 1955 and tactics 1955 must be different from doctrine 1945 and tactics 1945. Strategy has often been referred to as an "art" and we teach "military science" in our colleges and universities. With the tempo of change in the atomic age we must change our thinking and consider tactics, technique, and strategy as a continuing "operational process" where process 1954 is not the same as process 1955 but is constantly being reviewed, revised, and adapted to keep pace with changes in weapons, national culture, political concepts, production means, and the myriads of other variables that affect both the delivery and use of weapons on a battlefield and the willingness of the public to permit the use of those weapons.

MILITARY NOTES AROUND THE WORLD

UNITED STATES

Aerial Tramway

The development of an overwater aerial tramway which can shuttle ashore 15 to 20 tons of cargo at a time at speeds up to 30 miles an hour has been announced by the Department of the Army. Parallel steel cables supported by 100-foot-high steel towers provide the tracks for self-propelled "Skycars" powered by 135 horse-



Overwater aerial tramway speeds delivery.

power gasoline engines. The "Skycar" in its present form is a 2-place vehicle.—News release.

Battle Packs

Because Marines are expected to ride into their next war in helicopters, efforts have been made to reduce the weight of their battle packs. In an experimental

Marine Corps experimental battle pack (right) shown with World War II pack.

pack the weight has been reduced by 60 percent. The assault marine carried 58 pounds of equipment ashore in World War II while the new experimental pack contains 18 pounds of equipment.—News release.

Jungle Destroyer

A vehicle packing the wallop of an *M-24* tank, yet so light on its feet that it can roll over a pocket watch without damaging it, has been designed to uproot heavy trees and underbrush with pushbutton ease. The machine, known as the "Tree Crasher," is so powerful that during tests it was made to push, checkerboard style, a pile of metal weights equivalent to 75

"Tree Crasher" designed to clear jungle.

automobiles. Each of the six mammoth wheels of the vehicle has within its rim an individual electric motor and gear reduction. The vehicle has an extreme degree of "flotation" and with the powerful motor in each wheel, it is particularly suited for work in swampy or sandy areas. Another application which may develop for the machine is that of transporting heavy loads over rough terrain. The top of the vehicle forms a convenient platform 39 feet long and 11 feet wide capable of supporting more than 200,000 pounds.—News release.

Continuous Watch

Many of the ground observation posts scattered about the country have gone on a continuous 24-hour basis. Some areas, however, will remain on a standby basis. Among the areas going on the continuous basis will be the border strips of which El Paso, Texas, and Tuscon, Arizona, are the centers.—News release.

Training Exercises

The tentative schedule of training exercises to be conducted by the Army during Fiscal Year 1956 includes eight planned operations involving approximately 135,000 troops in Arctic, amphibious, and mountain maneuvers. The biggest event is Exercise *Sage Brush*, a combined Army-Air Force maneuver to be conducted in the Camp Polk, Louisiana, area during November and December. It will involve approximately 110,000 ground troops and 30,500 Air Force personnel. Its purpose will be to provide training, under battlefield conditions, for troops in the fields of atomic, chemical, bacteriological, radiological, and electronic warfare. It will also determine the capability of Army and Air Force units operating jointly against numerically superior ground and air units. Exercise *Lode Star*, presently underway at Camp Hale, Colorado, will be conducted in three phases extending over a 9-month period. It is an exercise in mountain and cold weather operations and will include aerial and tramway supply and evacuation, tactical air support, mountaineering, and testing of equipment. About 5,000 troops will participate.

In Exercise *Command Post*, to be conducted at Army areas in the continental United States, the tactical and logistical support of ground operations under atomic warfare conditions will be tested. Designed to train officers in new concepts, tactics, organization, and techniques adopted by the Army, the operation will involve Army area headquarters, plus corps, division, artillery and supporting units assigned to it, and available Reserve and National Guard divisions. An operation providing joint training in the employment of Army and Air Force units under Arctic conditions will be Exercise *Arctic Night*. Exercise *High Seas Special*, an amphibious operation, will train personnel in the logistical support of amphibious operations.—News release.

Summer Uniform

Approval of a silver tan summer service uniform to replace the khaki which has been standard wear since the Air Force became a separate service in 1947 has been announced. The new silver tan items of apparel include a long sleeve bush jacket, both long and short trousers, a short sleeve shirt, and knee length stockings. It is expected that the summer uniform will be available through Air Force sales stores in tropical and semitropical areas by fall. Local commanders will determine where and when it will be worn. To give airmen sufficient opportunity to wear out or dispose of their present khaki uniforms, the wearing of the new uniform will not be mandatory until 1 July 1959.—News release.

Change Term

In a recent circular the Army has notified its personnel to discontinue the practice of including chemical, biological, and radiological (CBR) weapons with nuclear weapons in the "mass destruction" category. It said that CBR weapons are more properly categorized as "special purpose" weapons and that while they may attack masses of human beings, either directly or through the food supply, they do not affect matériel and structures in the same manner as do nuclear weapons. It was felt that the term had been used incorrectly in certain official publications. The Army is on record as opposed to what it calls "indiscriminate destruction," and in one of its recent field manuals declares that "indiscriminate destruction is unjustifiable in a military sense."—News release.

Armored Divisions

With the conversion of the 48th Infantry Division, a Georgia and Florida National Guard organization, to an armored division, the Guard will now have six armored divisions. This will mark the fourth such conversion within a year.—News release.

Jet Fuel Development

A new jet fuel that does not break down into engine-clogging gums and sediments as readily as older fuels is being tested by the Air Force. The fuel's stability at high temperatures permits its use as an efficient cooling agent for supersonic aircraft for it carries off the tremendous heat of jet engines. The fuel will resist breaking down at temperatures up to 500 degrees Fahrenheit. The process, known as "hydrocracking," was first used by the Germans in World War II when supplies of conventionally made fuel became low. Raw petroleum is broken down at high pressures and temperatures in the presence of hydrogen. Originally the cost made it an expensive process but the development of new chemical agents that act on the raw petroleum at lower pressures and temperatures and cheaper methods of making hydrogen have changed this.—News release.

Army Convertiplane

Described as a revolutionary aircraft, the Army's 4-place *XV-1* convertiplane combines the vertical flight characteristics of a helicopter with the speed and

Army's 4-place convertiplane begins tests.

range of a conventional fixed-wing aircraft. Its flight was said to have marked the world's first helicopter-to-airplane conversion.—News release.

Add Air Divisions

Because of the increasing threat of a Communist air attack and the resultant buildup of defensive forces, the Continental Air Defense Command plans to expand from 12 air defense divisions to 16, according to the chief of RONAD plans division. RONAD is the planning organization for the Continental Air Defense Command. Air defense divisions vary in size and include radar sites, fighter-interceptor squadrons, and ground observer corps squadrons. The new organizations are the 20th at Grandview Air Force Base, Missouri; the 37th at Truax Field, Wisconsin; the 58th at Wright-Patterson Field, Ohio; and Andrews Air Force Base, Maryland.—News release.

All-Magnesium Plane

An experimental jet fighter trainer built entirely of magnesium made what Air Force authorities described as a successful test flight recently. The single-jet plane needs fewer stiffening members and has 1,100 fewer parts than planes built of aluminum. Its designers and manufacturers say that the plane will cost 20 percent less to build than its aluminum counterpart and will be 10 miles an hour faster.—News release.

Increased Training

With an increase in the defense budget for the purpose, Army reservists in many units will train more hours this year than previously. The goal of the Reserve program is to increase the organized drills to 48 hours yearly for all Reserve units which would be called to duty at the outset, or soon thereafter, of a national emergency. Many of the units given a mobilization day assignment have been increasing their drill periods during the past 2 years. Approximately one-half of the 7,000 Organized Reserve units drilled at a rate of 48 hours a year during Fiscal Year 1955.—News release.

Mobile Igloos

In a drastic shift from the old-fashioned military tent, the Marines are moving into igloos that will have the mobility of tents and the strength of the Eskimo icehouse. Unlike tents the igloos will be cool in summer and warm in winter. They are light enough to be transported by helicopter. The Geodesic Dome, as the new shelter is known, is described as the first basic improvement in mobile military shelters in the past 2,600 years. It is a self-supporting structural frame of strong lightweight metal. Suspended from it is a weatherproof insulated cover of neoprene-coated synthetic fabric. The new shelters will be tested by Marine airmen and if satisfactory, ground troops will get them later. It is estimated that in the move of a single Marine aircraft wing equipped with the igloos to an advanced base overseas, a saving of 15 million dollars would be realized over the present system. The domes come in four sizes with diameters of 36, 42, 55, and 117 feet. The two larger domes are for aircraft hangars.—News release.

Study Hull Cracking

The reason for the breaking up or hull cracking in more than 200 United States ships following the war is believed to have been discovered by American and British experts working on the problem. The hulls of American wartime ships were constructed of conventional steel called A-7 ship steel. In the North Atlantic and Arctic these ships failed time and again; however, in the Caribbean they had no trouble. The hulls cracked at the rate of 5,000 feet a second and gave little opportunity to save the crewmen. Experiments proved that low carbon content in steel and high manganese content was the answer to the problem. Tests are being conducted on a steel which it is reported will function in zero temperatures without faulting.—News release.

Interim Uniform

A modification of the uniform worn by officers and airmen of the Air Force has been adopted as the interim uniform for the cadets of the Air Force Academy. The distinctive insignia and accessories include silver gray shoulder boards for the blue

Interim Air Force Academy uniform shown.

winter uniform and dark blue shoulder boards for the tan summer uniform with heraldic cloud design on both boards. The sleeves of the winter blouse will be encircled with alternate silver gray and dark blue braid. The cap will have silver gray braid around the hat band with an insignia in the design of gold wings with a silver propeller in the center. The Air Force announced that this style uniform would be worn by the Academy cadets until a permanent one has been adopted.—News release.

Order 'BARCs'

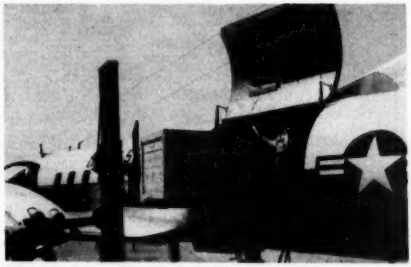
Following extensive testing of four experimental *BARCs*, giant amphibious vehicles each capable of moving 60-ton payloads from ship to shore, the Army has ordered 14 of them.—News release.

Guard Training

A new program under which 12,000 National Guard enlisted men may volunteer each year for 8 weeks of basic combat training at Active Army installations, where they will be integrated with other trainees, has been started. Upon completion of the training program the man will return to his state organization prepared to take advanced individual training. It will permit commanders to place emphasis on unit type training in the Guard.—News release.

Tripurpose Plane

The Navy's new *R4Y-1* tripurpose plane designed to carry cargo, passengers, or litter patients is undergoing production flight testing and will be delivered to the Navy soon. It is powered by twin 2,400-horsepower engines. The plane has a reinforced plastic-covered flooring of extruded magnesium which can support a load of 300 pounds per square foot. The 10-foot wide



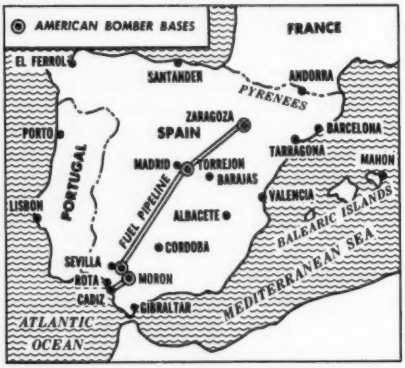
Navy plane features 10-foot cargo opening.

cargo door on the left side permits use of a crane or fork lift to load or unload the plane. As a personnel transport the *R4Y-1* can carry 44 passengers in removable upholstered seats which can be faced either forward or rearward. As an evacuation transport the plane can carry 27 litter patients. Its payload is 12,000 pounds and the gross weight is 47,000 pounds. The maximum speed is 314 miles an hour and it has an average cruising speed at 20,000 feet of 284 miles an hour.—News release.

SPAIN

Bases Advance

Construction of United States bases in Spain is advancing at what is described as a satisfactory pace. It is reported that two major Air Force installations at Torrejon and Zaragoza will possess minimum operational facilities by the end of 1956. It is expected that they will be ready for full operational use by mid-1957. The bases at Moron and San Pablo at that time will be partially operational. The biggest single-base construction job in Spain, the United States Navy's port and air station at Rota, is expected to be completed by 1958. Advanced planning is progressing on three additional airbases in the Cordoba, Albacete, and Tarragona regions. Present plans call for the establishment of a Strategic Air Command division in Spain with headquarters at Torrejon. Work is progressing on a 485-mile fuel pipeline to link the airbases with the projected naval port and fuel storage depot at Rota. The pipeline, capable of reverse flow, will have seven pumping stations when completed next year. The plan includes the building of facilities for ammunition and petroleum storage at the existing Spanish naval bases at El Ferrol, on the Atlantic, and at Cartagena, on the Mediterranean. The program will cost about 300 million dollars.—News release.



WEST GERMANY

Organize Air Arm

In the plans for the air arm which will support the country's Atlantic Pact Army, Germany plans to have more than 1,000 modern jets. The new Air Force will not be known as the Luftwaffe and it will not have any strategic bombers. The new force has been tentatively called the *Luftstreitkrafte*, literally air-fightpower as contracted with Luftwaffe or air weapon. The new force will have about 1,326 planes mainly confined to an Army-support role. The Federal Republic renounced the use of long-range bombers along with atomic, bacteriological, and chemical weapons. The new Air Force will have eight 75-plane squadrons of fighters; six 75-plane squadrons of fighter bombers; two 36-plane squadrons of all-weather fighters; two 54-plane reconnaissance squadrons; and two 48-plane transport squadrons. All the planes with the possible exception of the transports are expected to be jets. The types of planes to be used have not been determined but as there is no German aircraft industry the planes will have to come from abroad. The two fighters being considered are the British *Hawker Hunter* and the American *Sabre* both used by NATO with which the Germans will be operating. There will be about 80,000 men, all volunteers, in the force, including about 2,000 pilots. Only a few hundred will be former members of the Luftwaffe. All members of the force will have 3 months of infantry training, then pilots will be sent to British and American training schools in Germany. It is expected that 2 years will be required before the new pilots are sufficiently qualified to take the air in combat-ready squadrons. Difficulty is expected in attracting men for the ground technical services because of competition from German industry. The rates of pay and conditions of service are not expected to be announced by Parliament for another 6 months.—News release.

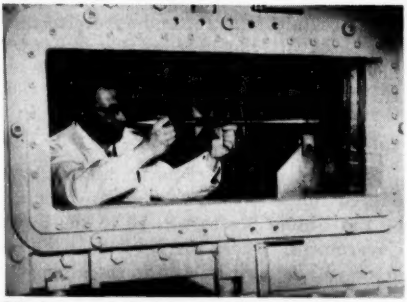
GREAT BRITAIN

Shift Control

Control of the 141-year-old Simionstown Naval Base which houses Great Britain's South Atlantic Fleet is being transferred to South Africa. Great Britain will continue to use the huge base, described as an "African Gibraltar," in peace and war. It was of great value during World War II when other routes were closed.—News release.

Test Heat Barrier

In a new wind tunnel at a guided missile plant in England, rockets, jet engines, guided missiles, and jet planes will be able to "fly" at 2,000 miles an hour. The



Wind tunnel designed to test heat barrier.

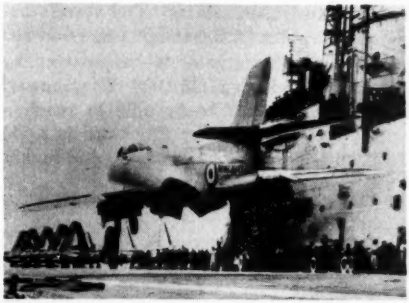
tunnel is designed to carry out tests within the range of the heat barrier—speeds at which heat generated begins to distort aircraft structures. The tunnel, known as the Mach 3, covers 30,000 feet of floor space and swallows up more than 1.5 tons of air a minute.—News release.

Aircraft Engines

Described as revolutionary designs for powering helicopters, two new British aircraft engines have been announced. They are the *Oryx One*, with 750 gas horsepower, and the *Oryx Two*, with 700 gas horsepower. Both are turbogas generators and dispense with the gears, clutches, and cooling system of conventional systems.—News release.

Exercise 'Shop Window'

During Exercise *Shop Window* the new *Supermarine 525*, prototype naval jet fighter, made its first "touch and go" landing. The exercise was a demonstration



***Supermarine 525* demonstrates its ability.**

of naval operations at sea presented by the Royal Navy for foreign naval and military attachés, Air Force, and Army personnel. It takes place regularly in the English Channel.—News release.

Antisubmarine Task

Great Britain's first twin-engine, twin-rotor helicopter, the *173*, has been ordered in large numbers by the Fleet Air

Helicopter picked for antisubmarine task.

Arm for antisubmarine work. It is powered by two radial air-cooled piston engines and can carry from 10 to 13 passengers. Its over-all length is 78 feet 2 inches.—News release.

USSR

Aircraft Carriers

The Soviet Union is reported to have under construction at a naval base on the Black Sea two aircraft carriers approaching in size the latest *Forrestal* type vessels of the United States. The vessels are said to displace 55,000 tons, to be from 800 to 1,000 feet long, and to be powered by engines developing 150,000 horsepower. They are expected to be able to reach a speed of 35 knots. The *Forrestal* is 1,043 feet long, displaces 59,900 tons, and makes 35 knots.—News release.

Jet Transport

The Soviet Union recently revealed a 4-engine jet transport plane apparently suitable for both military and civilian use. The Soviets also showed a turboprop intercontinental bomber, a twin-engine all-weather jet fighter, a supersonic single-engine jet fighter, and a twin-rotor, troop-carrying helicopter. The transport was not a modified bomber but an original design resembling the British *Comet*. The plane does not appear to be in quantity production, however the United States has yet to flight test her first jet airliner. The capacity of the new transport was not disclosed. The twin-rotor helicopters contained ramps which dropped down from the tail of the machine. Small trucks carrying men or pulling light field guns rolled down the ramps. The helicopters appeared capable of carrying 40 to 50 men.—News release.

NORTH KOREA

Transfer Interest

The Soviet Union announced recently that she had transferred her share of the joint Soviet-North Korean sea transport and oil refining companies to the North Korean Republic. The Soviet Union will be compensated by deliveries of goods of unspecified value over an unspecified period.—News release.

SOUTH KOREA

Increase Reserves

The United States has tentatively agreed to support the creation of three more South Korean Army Reserve divisions. This plan would increase the total South Korean ground force from 31 to 34 divisions. At present there are 20 Army and 1 Marine division on active duty with 10 Army divisions in reserve.—News release.

PAKISTAN

To Join Alliance

Pakistan is expected to formally join the Turkish-Iraqi-British defense alliance in the near future. After Turkey and Iraq had signed a 5-year mutual security pact, Great Britain joined it and agreed to turn her bases in Iraq over to that country's Government.—News release.

SWITZERLAND

Sell Reactor

The first nuclear research reactor ever offered for sale to a foreign government by the United States will go to the Swiss Government. Under the agreement the reactor will be used solely for research purposes related to the development of the peaceful, beneficial, and humanitarian uses of atomic energy. It was reported that Switzerland would pay 180,000 dollars for the reactor, associated machinery, and other supplies.—News release.

Underground Bases

Constructed out of solid rock beneath the Alps by the Swiss are atomic bomb-proof fuel reservoirs, aviation repair shops, and ammunition depots. In the fuel storage depot, the first of several to be built, it was reported that there were huge caverns which housed 550,000-gallon tanks. The aviation repair depot had spaces able to hold several damaged planes. The ammunition depot was said to be practically 100 percent safe from explosion.—News release.

JAPAN

Defense Forces

Under present plans Japan hopes to have reached her goal of a defense force totaling 259,000 men by 1960 and to be able to defend the homeland alone by that time. Under the mutual security pact concluded with the San Francisco peace treaty, the United States is responsible along with Japanese forces for the defense of the country until the Japanese can take over entirely. At the present time the Japanese self-defense forces number approximately 168,000 men. The Japanese forces have been given full responsibility for the island of Hokkaido and it is expected that the United States is to turn over the island of Kyushu to them soon. Japan's military budgets are low with the present one allocating about 283 million dollars for defense, less than 3 percent of the national income. By 1960 the country hopes to have a ground force of 180,000 men, a Navy of 35,000 men and 183 ships, and an Air Force of 44,000 men with 1,248 planes.—News release.

VIETNAM

Expand Army

Instead of reducing its Army to an elite force of 100,000 men, the South Vietnamese Government plans to expand its present strength at least temporarily by absorbing men from the private armies of the Hoa Hoa and Cao Dai religious sects and the Binh Xuyen. The present and planned strengths of the Army were not revealed but at the beginning of the year it was reported to have been 220,000 men. As no increase in United States allocations for the force is contemplated at present, the Government will have to draw on funds slated for other purposes to accommodate the additional manpower. It was feared that the manpower of the broken private armies might prove ready recruits for the Communists if not given a chance to join the Regular Army.—News release.

CANADA

Atomic Power

It is possible that electric energy for operation of the Distant Early Warning (DEW) radar line in the Canadian Arctic may be provided by atomic powerplants. Provisions for the construction of such plants by the United States is contained in agreements signed by the two countries providing for a wider exchange of information between them on defense against atomic attack and development of atomic energy for peaceful purposes. According to the report the cost of transporting conventional types of fuel to the area of the DEW line will be high.—News release.

EGYPT

Improve Canal

Condemned as too narrow for modern shipping, the Suez Canal is now undergoing another major improvement program. Because of the increase in traffic in postwar years on the 103-mile canal, there have been serious traffic jams, and in addition the construction of larger vessels has made the 197-foot wide canal too narrow. To cope with the problem, the Suez Canal Company has launched a 22-million-dollar improvement program. To relieve traffic jams two new bypass canals are being built. One is near the northern end while the other is at the southern exit. A third bypass midway along the canal has been in operation for 4 years. The two new bypasses will enable the canal to handle an average of 48 ships a day, with a peak of 60, instead of the present daily average of 36 ships. Before the war the average daily number of ships using the canal was only 14. Ships still will have to travel in convoys under the new system. In addition to the bypasses the canal will be widened in certain places and deepened over half its length to allow the passage of vessels of 36-foot draught.—News release.

BRAZIL

Aluminum Plant

South America's biggest aluminum plant recently started production at Sao Paulo. It is reported that the new factory will produce 50,000 tons of aluminum a year when finished.—News release.

Buy Transports

The Brazilian Government recently purchased 12 *C-82 Flying Boxcars* and will place them in military logistical and troop carrier service with the Brazilian Air Force later this year. The planes, presently in storage, will be overhauled and modified before their delivery. They include models on which a number of recent modernization features were added while they were in service with troop carrier units of the United States Air Force. Modifications will include the addition of emergency air brake systems and newer fire prevention and protection systems, as well as improvements in the exhaust and fuel systems.—News release.

FRANCE

Defense Budget

During 1955 France is expected to devote 2.8 billion dollars to national defense. For the first part of the year the defense program was financed by short-term appropriations voted by Parliament. The defense budget amounted to approximately 3.1 billion dollars in 1954 and present plans call for a defense budget of 2.8 billion dollars in 1956.—News release.

'Sipa 1,000'

The development of a 2-seat lightweight plane designed for mass production has been announced in France. The *Sipa 1,000* known provisionally as the "Coccinelle," weighs 660 pounds, has a cruising speed of 106 miles an hour over a range of 375 miles, and a fuel consumption of 31.5 miles a gallon. The plane requires a very small landing area.—News release.

INDIA

Adopt Metric System

In the Government's plans for the modernization of the country's industry and commerce, India will adopt the metric system for weights and measures. There has been a wide variety of measures in use in the different localities. The change in measures will be preceded by the decimalization of the Indian currency. It is expected that it will require about 10 years to complete the changes. It is believed that the move will have great influence on other Asian countries who are considering changes in their system of weights and measures.—News release.

AUSTRIA

Proposed Army

Under a coalition plan it appears that the Government will agree on universal military training and the building up of a mobile force of 25,000 to 30,000 men with the term of service expected to be 9 months in Austria's new Army. Austria is neutral under her new treaty of independence and it has been stated that the new Army will not be invincible, but should be strong enough to force even a major enemy to think twice before attacking.—News release.

ARGENTINA

Antarctic Base

A new base on the Antarctic Continent near the tip of the Trinidad or Louis Philippe Peninsula has been established by the Argentine Army. The size of the new base was not given.—News release.

URUGUAY

Military Mission

Plans have been completed to send a United States military mission to Uruguay to give the country's Army a modern training program. A 40,000-dollar appropriation to defray the expenses was approved by the Government.—News release.

FOREIGN MILITARY DIGESTS

"Goose Eggs"

Digested by the MILITARY REVIEW from an article by Lieutenant Colonel P. N. M. Moore in "The Army Quarterly" (Great Britain) January 1955.

"WHAT I want to know," said my fellow spectator, "is what goes on inside the goose egg?" We were attending a high-powered Army exercise on the tactical use of the atom bomb. A corps of two infantry and two armored divisions and attached troops were holding a river line in northwest Europe. The model looked like a surrealist's nightmare, with infantry and armored divisions disposed in "goose eggs" of varying sizes. The infantry divisions were being invited to hold fronts of anything up to 30,000 yards.

Talking with other spectators over our coffee after lunch helped us a bit, but the wide variety of opinion forced me to sort out my own ideas. This article on the effect of atomic weapons on the infantry division in defense is the result. It may be wrong. In fact, it is sure to need substantial correction, but the great thing when correcting is to have something to correct, and this may provide a useful "Aunt Sally."

We will consider the air-burst 20-kiloton atomic missile. At 3,000 yards from ground zero nearly all troops in the open will become immediate casualties, and at 800 yards there will be the same effect on troops behind armor or under 18 inches of head cover. Also, allowing for inaccuracies of delivery by air, we cannot drop an atom bomb within 3,000 yards of our own troops dug-in, or within 5,000 yards if they are in the open. Bigger and better atom bombs may be used, but these radii are roughly in proportion to the cube root of the power of the bomb. For instance, to double the radii we need a bomb eight times as powerful. Increases in bombpower mean relatively small increases in the danger radius.

Even then the relative increase in destructive effect between the 20-kiloton atomic missile and high explosive is at least as great as that between high explosive and the cannonball. No one in their senses would match an army with muzzle-loading cannon against one equipped with modern artillery, and expect it to win. Therefore, we will assume that both sides have atomic missiles of 20-kiloton power which can be delivered by light bombers, fighter bombers, or 280-mm cannon.

Weapons Available

Any argument about the use of atomic weapons is always bedeviled by ignorance on the probable scale of their use. For this article a very rough assumption is made based on relative cost, which, even in war, is still a fair measure of industrial effort. In very round figures, the 25-pounder shell alone, today, costs 14 dollars, and the cost of a 20-kiloton bomb is not likely to be less than 1.4 million dollars. Again in round figures, 600,000 rounds of 25-pounder ammunition were fired at El Alamein to support an initial break-in 8 miles wide on an army front of 40 miles, representing a cost today of 8.4 million dollars. If after 3 years of war we could do this, it seems reasonable to assume that an enemy in western Europe might, at the outset, be prepared to expend six atomic missiles at 1.4 million dollars each to secure a break-in on a similar scale, say, on a corps front, and have an additional six in reserve. There are dozens of "ifs" and "buts" to this argument, but to some extent they cancel each other out and the estimate seems reasonable.

A division today uses 400 tons daily in active operations. Very broadly, 260 tons of this is gasoline or ammunition, and 140 tons supplies, mail, and engineer and ordnance stores. The gasoline is needed to move it, and the weight of ammunition is a measure of its striking power. The scope for reduction in the tonnage required by the present division is not large. It might be reduced to 300 tons a day by a very hard scale of living and a substantial reduction in vehicles.

How to bring this tonnage into the theater when our ports of entry are so vulnerable is beyond the scope of this article. However, if active operations require 300 tons a division a day, it is probable that a way will be found of providing it. Savings, however, there must be, and a cut in the road transport of the division, with its consequent reduction in the petroleum, oil, and lubricants, workshops, and drivers needed, seems the best if not the only field for reduction.

When we come to the division in defense, we shall see that a reduction in road transport in the division area is a tactical necessity in addition to being administratively desirable. In the face of an atomic threat, there simply is not room in the division area for the mass of soft-skinned vehicles at present carrying the supporting arms and services.

Effect on Air Battle

Of all the vital and vulnerable targets spread out in front of the enemy atom bomb target selection teams, our Tactical Air Force on its airfields looks the most important and the most vulnerable. The Tactical Air Force aircraft which fight in the air must have a high performance, and this means solid runways. Although a withdrawing force has the advantage of being able to fall back on a complex of prepared airfields, the resources for building large numbers of these simply do not exist. Further, they are difficult, if not impossible, to conceal.

The opening phase of any land campaign will, therefore, see a desperate battle for local air superiority between the opposing tactical air forces. Jet-to-jet fighter attrition rates are small, and both sides are likely to concentrate the weight of their air effort against enemy airfields. The loser will have his airfields forced back far enough to be out of range of enemy fighter bombers and to allow his control and reporting centers enough time to arrange interceptions of enemy light or medium bombers.

This air superiority, once gained, is not an end in itself. Its purpose is to enable the winning side to make full use of atomic missiles delivered from the air against the opposing ground forces.

At the start of a war it looks almost

certain that our own Air Force will be on the defensive, although the defensive entails attacking enemy airfields without atom bombs. The most that we might, therefore, expect from the air in the first few weeks is air reconnaissance and the delivery of atom bombs on the enemy by night or in bad weather, when the ground situation has become so serious that there may be a risk of further withdrawal. Such a withdrawal, it should be remembered, will, against a superior air force, entail a still further withdrawal of our Tactical Air Force airfields.

Division Effect

The great problem for the defender is to dispose his forces so as not to offer the enemy atomic targets, but at the same time ensure that the enemy will concentrate, and thereby offer atomic targets in the shape of infantry or guns in the open, or vulnerable concentrations of armor.

Current thinking on the front which an infantry division may be asked to hold against the enemy varies from 9,000 to 15,000 yards in the plains of Germany or northern France. It is of interest that the front actually held by the Commonwealth division in Korea was approximately 14,000 yards. This figure does not appear to be getting any less, and with our limited manpower we are always likely to be extended even further, particularly at the beginning of a war.

The main effect of the introduction of the high explosive shell and the machinegun was to force all armies to fight on wider fronts. The effect of the atomic weapon surely will be the same. Neither the attacker nor the defender can afford to concentrate forces so that a large proportion of them can be wiped out by a single missile.

What is a large proportion? The risk taken will depend, of course, entirely on the aim. In the defense against an enemy with 12 atomic missiles, the destruction or incapacitation of a major unit, say a battalion of infantry or a regiment of artillery, is probably the absolute maximum that any corps commander could possibly contemplate losing to one missile. From this we come to our figures, 3,000 and 800 yards. Immediately we find a big difference between the dispersion required of a battalion dug-in and that needed by a battalion deployed for the assault but, for safety reasons, far enough away from our own troops to be a suitable target. Against this, the battalion dug-in is, once located, a static target, but an assaulting battalion need only concentrate in the danger area for a limited time, and is, therefore, a fleeting target for atomic weapons.

Infantry Battalion

The battalion dug-in will, very roughly, have to occupy an area at least 2,000 yards square, with a side more than 1,600 yards. Any greater concentration is presenting an atomic target. Within this area the companies will be holding vital ground, and we can and must afford a considerable degree of concentration in the companies so that the platoons of the companies are mutually supporting by day and night. Assuming the battalion to be deployed "two up," the companies will need to be mutually supporting by day to some extent. Here we come to our first change in organization—a need for a direct-fire automatic weapon with the rifle companies, with an effective range of about 1,000 yards. The *Bren* and the *FN2* rifles are not accurate enough, and the *Vickers* medium machinegun is too heavy. Even if this gun were used in defense only and handed over on relief as a trench store, it seems that six with the support company are not enough. By night, serious attempts at penetration between company localities cannot be prevented without the expenditure of prodigious quantities of ammunition fired on fixed lines.

This enemy ability to penetrate at night, although worrying, is not disastrous. Provided we have enough depth at dawn we should have the enemy just where we want him. Unfortunately, tactical features are not conveniently spaced at 2,000-yard intervals, and there may be important ground between the forward companies and reserve companies. However, the enemy will not be dug-in on this, and should be ill-placed to meet a counterattack. However, counterattack there must be. Any counterattack by one of the reserve companies to retake a forward company position or to eject an enemy from intermediate tactical features is likely to create a serious gap in the fire plan. It seems, therefore, that our battalion is unlikely to survive on its own. So one bit of our "goose egg" is looking clearer. We need the gaps between brigades rather than between battalions.

Infantry Brigade

Now what are the requirements of our brigade-defended areas? They must have depth to soak up and absorb the enemy's attack. They must contain a "counter-attack" force capable of recapturing one or more company localities once the infighting has begun and there is no risk of either side using atomic weapons. They must also be really capable of all-around defense; that is to say, they must present a front to the enemy in both flank and rear although it may not be so strong a front as that presented against the most likely line of approach.

These requirements cannot be met with a 3-battalion brigade. In particular, either depth or the counterattack force have to be sacrificed. With the greatly increased importance of all-around defense, owing to the gaps between brigade-defended areas, a fourth battalion is surely essential in the brigade itself.

If we organize our defended areas on a brigade basis, do the flank companies of adjacent infantry battalions need to be mutually supporting? This entirely depends on the ground and the amount of supporting fire that any battalion commander can get from his brigade to help a forward company in trouble. Once the enemy has broken into our position by knocking off a forward company, we cannot use atomic weapons to support a deliberate counterattack. Our own troops are too close. If the entire brigade area is not to be too congested, it looks as if we must compromise. Companies of adjacent battalions might be mutually supporting with antitank weapons but not with small arms fire, say, as a very rough rule, 2,000 yards in open country. This calls for an infantry antitank weapon of a longer effective range, if it can be produced without increasing the weight or size, or a wider use of heavy-gun tanks with the forward companies.

Let us see how far we have gone. The pattern of our defense is a 4-battalion brigade holding vital ground with a series of mutually supporting defended localities in depth, with 18 inches of head cover. Assuming the two forward battalions are each two companies up, this looks like a front of at least 6,000 yards and a depth between 3,000 and 4,000 yards in the brigade-defended area. To overwhelm this defense requires the accurate placing of at least 6 air burst 20-kiloton missiles, followed up within the hour by not less than one enemy infantry regiment of three battalions in armored personnel carriers (APCs) with tank support. Once the enemy has broken into the position, he will be restricted in his use of atomic weapons in support of his infantry, and any of our surviving company localities will be tough nuts to crack. We seem to have succeeded in forcing the enemy to concentrate. The problem is now to detect the concentration in time.

It may be argued that if the brigades are to be capable of all-around defense,

four battalions are not enough; and that four in firm positions and a fifth as a counterattack force are necessary. This must depend on the ground. Five battalions may well be too much for one man to command. If we have a closed perimeter defense, the reserve companies support each other more closely, and the defense gets tougher the further the enemy drives in to the position. Try it yourself with some pennies on a 1-inch map. A penny has a radius of 1,000 yards at this scale. In such a case, the brigade can either put all four battalions on the perimeter and reduce the counterattack element to two or more companies, or one or more of the battalions might be three companies up. The solution depends entirely on the ground.

Artillery Support

Supporting fire for such brigade areas will take two forms. We cannot use the atomic weapon within 3,000 yards of our own troops, even when they are dug-in. We need, therefore, a weapon which will cover the gap between the infantryman's direct-fire weapons and the atomic weapon. Heavy mortars seem the best answer. The 4.2-inch mortar, with its extreme range of 4,100 yards, would do if we could increase its range by 2,000 yards and improve its accuracy. The mortar, too, has the great advantage in that it is easily dropped by parachute, and can be fired from a pit with partial overhead cover, as the Chinese have shown us.

The towed 25-pounder is dead. It is too vulnerable in the open. In covered gunpits, its arc of fire is too restricted. Its range is longer than needed for the intimate support of infantry battalions within a brigade perimeter, and its range and lethality is utterly inadequate for dealing with penetration between brigade-defended areas. For dealing with enemy concentrations outside the 3,000-yard range, and particularly for dealing with enemy penetrations between defended areas, we must have a ground-to-ground missile. Although the most uneconomical in fissile material for obvious reasons, the 280-mm atomic shell is one way of delivering an atomic missile accurately, while at the same time being positive in action. Once the shell has been fired, there is nothing on earth which can prevent the atomic shell arriving at the other end. This is a weapon which the Army must have if it is to survive in war today. By virtue of its necessarily large caliber, the range is tremendous, say, 20,000 to 30,000 yards. Here, surely, is the true descendant of the division artillery concentration, the division commander's weapon. The gun does, however, bring great problems of concealment, movement, and bridging in its train.

This weapon—the atomic gun—will dictate to some extent the gaps between brigades. Allowing two brigades up and one back, such a weapon or group of weapons must be able to reach out 3,000 yards in front of brigades. This gives a gap of about 12,000 yards between brigades, and allows a division to cover a front of about 30,000 yards; this is not far off our "goose egg," which covers a front of 18 miles. It is interesting to note that 6,000 yards, or half this gap, is the average visibility we might expect in the European theater.

The Counterattack

Now what happens if the enemy does deliver six 20-kiloton bombs against one of our brigade areas? The brigade of four battalions, together with its supporting mortars, is largely destroyed. The lucky companies in the good battalions will hold out, and the enemy following up quickly in APCs and tanks will have quite a bit of fighting to subdue the last flickers of resistance. In any case, the enemy has a formidable consolidation problem. The defending commander must clearly stage a deliberate counterattack. British com-

manders are unlikely to support this counterattack with atomic weapons while there is any chance that our own men are holding out in part of the positions. Some enemies in defense might well be more ruthless. However, if we have accurately pinpointed the enemy bursts, we can fire atomic shells to burst in exactly the same place without inflicting any further casualties on our own troops. An air-delivered missile could not be accurate enough for this. The enemy, moreover, is badly placed.

Picture the enemy regimental commander. He has arrived on the objective with his battalions in their APCs. The defenses are ruined and full of dead, and he can expect an atomic missile or a counterattack very shortly. What does he do? Tell his men to dismount and dig-in, go on into an atomic killing round, or wait to receive our counterattack with his own tanks? His best chance of success looks like waiting to receive our counterattack with his own tanks. Once both sides are in close contact, use of an atomic missile by either side becomes impracticable in that particular area.

This brings us to the requirements for a counterattack force. It must clearly contain armor and infantry in APCs which can follow up and carry on the fight during the hours of darkness. The present infantry division has neither an armored regiment nor APCs. It will also require artillery support.

Here we start running into one of the biggest problems. It might be possible to use the fourth infantry battalion of the reserve brigade, but our division, with an armored regiment and enough APCs to lift an infantry battalion, is getting unwieldy. If we add a regiment of medium artillery, or self-propelled 25-pounders, this division battle is beginning to look like a corps commander's battle. However, we are considering "division goose eggs," and having introduced this grain of doubt we had better leave it. It is enough to say that the counterattack force is extremely vulnerable in its assembly and forming-up areas; and rapid concentration and dispersion, deception, and concealment are of vital importance.

Division Supply

Having received our three brigade areas and our counterattack force supported by ground-to-ground atomic missiles, they have to be supplied. There are three possible agencies: 3-ton trucks, transport aircraft dropping supplies, and helicopters.

For a start we must go back to the old principle taught between the wars that supplies, ammunition, and petroleum, oil, and lubricants come up from rear to front, and units do not go back to get them. The ability of units to go back and bring things with their organic transportation, and a general and quite unjustified distrust of the administrative services have led to a multiplication of A echelons and B echelons—all of which mean more vehicles in the forward areas. These conglomerations of vehicles are hopelessly vulnerable, and simply must be eliminated.

If we use the 3-ton truck, supplies, gasoline, and ammunition will have to be delivered directly at night on the endless belt system—vehicles running at wide intervals unloading quickly and getting out before the next vehicle arrives. This also means unloading directly into battalion and mortar-battery positions. Well organized and with good training and traffic control, each vehicle should be in the battalion area for half an hour. If we allow a maximum of only 12 vehicles unloading in the brigade area simultaneously, we could theoretically move 144 x 3-ton loads into the brigade area in a 6-hour summer night. Assuming a speed of 8 miles an hour, this gives a density of 3 vehicles to the mile each way, which does not provide an atomic target.

Against this the roadmaking commitment is an enormous one, leading in its

turn to vulnerable concentration of engineers and roadmaking machinery. In northwestern Europe, where a good road system already exists, the 3-ton truck, under division control, delivering direct to companies and mortar batteries, would probably supply the brigade area in the opening phases of the battle. Such a system is, however, predisposed to interruptions, and units would have to hold 4 or 5 days' food, water, and ammunition to guard against a breakdown of the system.

Low-flying, slow-flying transport aircraft delivering food and ammunition by parachute at night is at first sight an attractive solution. It would be unwise, however, to bank on this, as the enemy all-weather, near-the-ground fighter capacity may improve; and, once we are in close contact, casualties from radar-directed light antiaircraft would be prohibitive. Also, developments in airborne early warning radar to pick up moving objects as distinct from ground returns might make air supply at night almost impracticable in a difficult air situation. Air supply also brings a considerable drop zone clearance problem in its train. In all, transport aircraft are an essential component of the supply system, but they are extremely expensive and can be very vulnerable. However, they do away with a large engineer road commitment.

Helicopters for supply have been suggested. Their payload is, however, small; and the numbers presently required, and the resulting vulnerability would present a traffic-control problem no less than that posed by the 3-ton truck. They are even more expensive than transport aircraft, but they do away not only with the engineers' work on the roads, but also with the work on the rear airfields. Their use in large numbers must depend on successful further development. In undeveloped theaters their possession will give the division supply system great flexibility.

Movement

The problem of moving this division about the countryside remains. Both sides, however, will be so apprehensive of atomic attacks during the early stages of a war that there will not be much movement after initial deployment. If the division has to move, very careful plans will have to be made; and there will be time to get transport, either 3-ton trucks or helicopters, from corps or army.

Covering Troops

Finally, there is the tricky 48 hours while the brigades are digging-in. During this period, as well as protection from air-dropped missiles, the enemy ground-to-ground atomic missiles must be held at arm's length; and for this armor will be needed. This might be the division counterattack force or, preferably, an armored car regiment with more punch and stopping power than the present one—and backed up by the self-propelled artillery regiment.

This division is tailored for the purely defensive battle from dug-in positions. However, every defensive campaign will entail both withdrawals and offensives, with limited objectives. Here this division has undoubted weaknesses.

If the infantry has to withdraw long distances on foot, they will be too exhausted to dig their new positions in time. Digging reserve positions ready for the withdrawing infantry might in theory get over this, but such positions require much time, labor, and resources to prepare, and all too frequently do not fit the needs of the moment when the time comes to occupy them.

If movement to the rear is in corps or army vehicles, the next position must be at least 40 or 50 miles back to allow the rearguard mobile troops, in conjunction with demolitions, to gain enough time for the infantry to dig-in. Such a maneuver will, under conditions of air inferiority, require a very high standard of staff work and unit discipline.

The limited offensive is even more difficult. The division must be able to concentrate and disperse very quickly. For this it needs more APCs and more armor, which can only come from army resources. This requires not only good staff work but first-class radio communications, practice in using the APCs, and in co-operating with the armor.

The radio communications must be organic to the divisions. They are required for the defensive battle anyway. To make the additional armor, APCs, and soft-skinned transport a part of the division is tactically, administratively, and, above all, economically impossible. The problem of training is an immense one, but should not be insuperable.

Conclusions

So our "goose egg" is beginning to take shape. Although all frontages must depend on the ground, it is approximately 30,000 yards long. It looks rather like a checkerboard with two brigades up and one back, each in all-around defensive positions approximately 6,000 yards square, with atomic killing grounds in between. Brigades will be four battalions, with a 4-battery light regiment of 4.2-inch mortars to provide intimate support, and heavy-gun tanks for antitank defense. The division artillery is replaced by the 280-mm atomic cannon under division control. The counterattack force comprises an armored regiment with APCs to lift a battalion, and a self-propelled regiment, preferably medium.

This "goose egg" is not a billiard ball. It cannot move easily. The directors of finance in the War Office may even complain that it is so expensive that it might well be made of gold. On the other hand, it covers a large front of 30,000 yards, so the gold is spread pretty thin. If we can ask a brigade group to sit down in a 6,000-yard square, where six well-placed 20-kiloton atomic missiles can wipe it out in a single blow, the idea might work. If this is more than we can afford—it will not; and we shall have to think again. That might be the subject of a second article.

Studies in the Art of War

Digested by the MILITARY REVIEW from an article by Brigadier B. M. Kaul in "The Journal of the United Service Institution" (India) October 1954.

WARS have been a persistent fact in world history. They have great causes and little occasions. When wars come, they dominate our lives. They are like a tempest which blows through our streets, lifts the gray hairs of statesmen, invades our colleges, overwhelms our scholars, and virtually challenges every institution of our society. They offer inescapable tests to our private lives and public devotions, the stability of our economic and political structure, and to the sagacity of our foreign policy. There is no aspect of our existence which remains untouched.

However, wars are not acts of God. They grow out of what statesmen do or fail to do. They result from a nation's policies or lack of policies. Once they come, victory or defeat also ensues from what we do or fail to do.

It is essential, therefore, to study the development of strategy through the ages. If we are to have a durable peace, we must clearly understand the part armed forces play in international society. Eternal vigilance in the causes of war and the principles which govern its conduct is necessary. Remember, it is not force in

itself which is wrong but the purpose to which force is sometimes put. As Pascal said about three centuries ago, "We must realize that justice without force is impotent and force without justice tyrranical. We must, therefore, combine justice with force."

Strategy is not merely a concept of wartime, but is an inherent element of statecraft at all times. It so dictates the policies of a nation that the resort to war is either rendered unnecessary or is undertaken with the maximum chance of victory.

As society becomes more highly industrialized, the art of war becomes more complex. It, therefore, concerns us all. All of us must realize that it is our concern.

Sun-Tzu

Twenty-five centuries ago, a Chinese named Sun-Tzu wrote a book called, *The Art of War*. Although the chariot has gone and the weapons have changed, the maxims laid down in this book still hold because the author dealt with the influence of politics and human nature on military operations—which proves how unchanging the principles of war are.

Sun-Tzu's book brought him to the notice of King Ho-Lu who asked the author if his theories on discipline could be tested out among women. Sun-Tzu readily agreed and collected 180 women, divided them into two companies and placed one of the King's favorite concubines at the head of each. He armed them with spears and explained to them the difference between the front and back and between right and left. He then told them to look straight ahead when ordered "eyes front" and to turn left and right when ordered "left or right turn" and to turn right around toward the back when ordered "about turn." The girls said they understood these instructions. Then, to the sound of drums, Sun-Tzu gave the order "left turn," but none of the girls turned left. They only giggled. Sun-Tzu then told them firmly that if an order is not obeyed, because it is not properly understood, the leader who gives such an order is held responsible. Then he thundered "right turn," whereupon the girls did nothing except giggle again. He then said if an order is understood by all and yet not obeyed, the officers who command those who disobey must be held responsible and thereupon ordered that the two company commanders should be executed. The King, who was watching the scene from the top of a pavilion, seeing that his favorite concubines were about to be put to death, hurriedly sent a note asking Sun-Tzu not to kill them. Sun-Tzu sent back a reply that having once received a commission as general of his forces, there were certain commands of His Majesty which, acting in that capacity, he was unable to accept. Accordingly, he had the two women executed and installed the next two in order as leaders in their place. The drum was sounded once more and he ordered "left turn"—"right turn"—"about turn." This time the girls obeyed implicitly without uttering a sound and carried out various movements with utmost precision. This may be an old story but its moral is true to this day. It proves the importance of discipline in the army. It also proves that certain maxims remain eternally true.

There are four fundamentals which have governed the conduct of wars throughout history. First, there is the quality of the commander, his personality, courage, character, and professional ability. Second, there is the quantity and quality of troops, their professional skill, physical fitness, and morale. Third are resources—quantity and quality of weapons and equipment; stocks of food, arms, ammunition, equipment, transportation, and fuel. Fourth are the communications, including rail, road, inland waterways, and sea. There are some additional factors which also play an important part in all wars. They are terrain, weather, and luck. Referring to the element of luck, Napoleon described

war as a "calculation of probabilities." All captains of war are agreed that it is not all luck and gamble and have considered it essential to study the experience of their predecessors and to master the essential principles of war.

Sun-Tzu said it is the rule in war that if your forces are 10 to the enemy's 1, surround him; if 5 to 1, attack him; if twice as numerous, divide him; if equally matched, offer battle; if slightly inferior in number, avoid him; and if quite unequal in every way, flee from him. The army, according to Tzu, is the bulwark of a state. If it is complete in all respects, the state will be strong. If it is defective, the state will be weak. If you know the enemy and your own troops, you need not fear the result of a hundred battles. If you know your own troops but not the enemy, for every victory gained, you will also suffer a defeat. If you neither know the enemy nor your own troops, you will succumb in every battle. Hence, a general is skillful in attack whose opponent does not know what to defend, and he is skillful in defense whose opponent does not know what to attack.

Sheridan once explained the reason of Grant's victories by saying that while his opponents were kept busy wondering what he was going to do, he was thinking most of what he himself was going to do. Frederick the Great, in his instructions to his generals, said:

Those who have had but little experience, attempt to protect every point; while those who are better acquainted with their profession, guard against decisive blows at decisive points and acquiesce in smaller misfortunes to avoid greater. In other words, they keep away from sideshows.

The functions of a general are infinite. He must, of course, have courage, intelligence, professional knowledge, and physical fitness. He should never let his recklessness lead to destruction, let cowardice lead to capture, and let oversolicitude for his men impede his plans. He should have the ability to improvise and the ability to penetrate the minds of others while remaining impenetrable himself. He should be loved, feared, and obeyed. His orders should be precise and simple. He must see an opportunity and seize it. This is the greatest quality in the art of war and is the test of the most elevated genius. Unless a man has a born talent for war, he will never be more than a mediocre general. It is the same with all talents. In painting, music, or poetry, talent must be inherent for excellence. That is why we see such few outstanding men in these sublime arts.

In order to study the evolution of the art of war one really must peep into the lives of outstanding generals in history and see how they practiced this art. In other words, examine how the art of war has been executed through the ages. Thus, alone, can we understand its intricacies.

Let us study, therefore, some of the campaigns conducted by well-known military figures in the past.

Napoleon

Goethe said:

The story of Napoleon produces on me an impression like that produced by the revelation of Saint John the Divine. We all feel there must be something more in it. But we do not know what.

Napoleon was born on 15 August 1769. His father was a lawyer of Italian extraction living on the island of Corsica. He had eight children of which Napoleon was one. Napoleon graduated from the military school at Paris in 1785. His final report described him as, "character mild; outstanding merit in mathematics; would make an excellent sailor." At 16, he was posted to an artillery regiment. One of his examiners predicted "will distinguish in the world, if favored by fortune."

On 14 July 1789, when a French duke

brought to the King of France the news of the capture of the Bastille, the King exclaimed, "Why, that is a revolt?" "No sir," said the duke, "it is a revolution." Liberty, equality, and fraternity then became the order of the day and in its wake Napoleon had a phenomenal rise in life. A brigadier general at the age of 25, he became commander in chief 1 year later and monarch of France before he was 30. This meteoric career has few parallels in history.

The vigor of Napoleon's mind, so conspicuous in conversation, was equally remarkable in writing. His mind had great logical accuracy and imagination. Had he chosen to, he would have distinguished himself in the field of literature or science as he did in statecraft and soldiering. He had that comprehensive genius which would have been pre-eminent in any pursuit to which he devoted the energies of his mind.

Napoleon Bonaparte was influenced a great deal by the theories of two outstanding and original military writers of the eighteenth century, Bourcet and Guilbert. From the former, he learned the principle of calculated dispersion to induce the enemy to disperse his own concentration preparatory to the swift reuniting of his own forces; and also, the value of a "plan with several branches" and of the potentialities inherent in the new distribution of an army in self-contained divisions. From Guilbert he learned how to extend forces without exposing them, to embrace the enemy without being disunited, and to link up the moves or attacks to take the enemy in the flank without exposing one's own. He also learned from Guilbert the prescription for the rear attack as the means of upsetting the enemy's balance and concentrating mobile artillery to shatter a key point in the enemy's front. It was Guilbert's vision of a coming revolution in warfare, carried out by a man who would rise from a nation, that kindled Napoleon's imagination and ambition. Without his dynamic application, these principles might have remained a mere theory. Because his education coincided with his instincts and because these in turn were given scope by his circumstances, he was able to exploit the full possibilities of the new "division" system. In developing the wider range of strategic combinations lay Napoleon's chief contribution to strategy.

Dynamic rather than deep thinking, Napoleon did not evolve any clear philosophy of war. His working theory, so far as it found expression in his writings, was rather a hotch-potch of ideas, lending itself to misrepresentation by subsequent generations of soldiers who have hung upon his words.

This tendency, as well as the natural effect of his early experience, is illustrated in one of the most significant and oft-quoted of his sayings:

The principles of war are the same as those of a siege. Fire must be concentrated on one point, and as soon as the breach is made, the equilibrium is broken and the rest is nothing.

Subsequent military theory has put the accent on the first clause instead of on the last: in particular, on the words *one point* instead of on the word *equilibrium.* The former is but a physical metaphor, whereas the latter expresses the actual psychological result which ensures *that the rest is nothing.* His own emphasis can be traced in the strategic course of his campaigns.

The word *point* has been the source of much confusion, and more controversy. One school argues that Napoleon meant that the concentrated blow must be aimed at the enemy's strongest point, on the grounds that this, and this only, ensures decisive results. For if the enemy's main resistance be broken, its rupture will involve that of any lesser opposition. This

argument ignores the factor of cost, and the fact that the victor may be too exhausted to exploit his success—so that even a weaker opponent may acquire a relatively higher resisting power than the original. The other school, better imbued with the idea of economy of force, but only in the limited sense of first costs, contends that the offensive should be aimed at the enemy's weakest point. Where a point is obviously weak, this is usually because it is remote from any vital artery or nerve center, or because it is deliberately left weak to draw the assailant into a trap.

Here again, illumination comes from the actual campaign in which Bonaparte put this maxim into execution. It clearly suggests that what he really meant was not *point*, but *joint*—and that at this stage of his career he was too firmly imbued with the idea of economy of force to waste his limited strength in battering at the enemy's strong point. A joint, however, is both vital and vulnerable.

It was at this time, too, that Bonaparte used another phrase that has subsequently been quoted to justify the most foolhardy concentrations of effort against the main armed forces of the enemy. "Austria is our most determined enemy. . . . Austria overthrown, Spain and Italy fall of themselves. We must not disperse our attacks but concentrate them." However, the full text of the memorandum containing this phrase shows that he was arguing, not in support of the direct attack upon Austria, but for using the army on the frontier of Piedmont for an indirect approach to Austria. In this secondary theater, his aim—following Bourcet's guidance—was to knock out the junior partner, Piedmont, before dealing with the senior partner. In execution, his approach became still more indirect, and acquired a subtler form. For contact with reality shattered the dream which, after his initial success, he communicated to his government: "In less than a month I hope to be on the mountains of Tyrol, there to meet the Army of the Rhine, and with it to carry the war into Bavaria." It was through the frustration of this project that his real opportunity developed. By drawing Austria's forces into offensives against him in Italy, and defeating them there, he gained, 12 months later, an open road into Austria.

When Bonaparte assumed command of the Army of Italy in March 1796, its troops were spread out along the Genoese Riviera, while the allied Austrian and Piedmont forces held the mountain passes into the plains beyond. Bonaparte's plan was to make two converging thrusts across the mountains at the fortress of Ceva, and having gained this gateway into Piedmont, to frighten her Government into a separate peace by the threat of his advance on Turin. He hoped that the Austrian forces still would be in their winter quarters—although if they should move to join their allies, he had in mind a feint toward Acqui to make them withdraw in a divergent, northeasterly direction.

As it actually happened, it was by fortune rather than design that Bonaparte gained the initial advantage of separating the two armies. The opportunity was created by an offensive move on the part of the Austrians—who made a bound forward to threaten Bonaparte's right flank and forestall any French advance on Genoa. Bonaparte countered this threat by a short-arm jab toward the joint of the Austrian advance—although two more jabs at a neighboring point were needed before the Austrians accepted the repulse and fell back on Acqui. Meantime, the bulk of the French Army was advancing on Ceva. Bonaparte's rash attempt on 16 April, to take the position by direct assault, was a failure. He then planned an encircling maneuver for 18 April and also changed his line of communications to a route further removed from possible Austrian in-

terference. The Piedmontese, however, withdrew from the fortress before the new attack developed. In following them up, Bonaparte suffered another extensive repulse when he tried another direct assault on a position where the Piedmontese had chosen to make a stand. However, soon both their flanks were turned, and they were hustled back into the plains. In the eyes of the Piedmontese Government the threat to Turin from the oncoming French now loomed much larger than the Austrians' belated promise to march to their aid by a necessarily round-about route. The *equilibrium* was broken, and its psychological effect dispensed with any need for physical defeat to make the Piedmontese appeal for an armistice—which removed them from the scales of the war.

No commander's first campaign could have been better suited to impress him with the vital importance of the time factor—all the more because it would seem that if the Piedmontese had held out even a few days longer Bonaparte might, for want of supplies, have been obliged to retreat to the Riviera. Whether this reported admission of his be true or not, the impression made on him is shown in his remark at the time: "It may be that in the future I may lose a battle, but I shall never lose a minute."

He was now superior to the Austrians alone—35,000 to 25,000. Did he advance directly upon them? No. The day after the armistice with Piedmont had been settled, he took Milan as his objective; but Tortona to Piacenza was his indirect way—on to its rear. After deceiving the Austrians into a concentration at Valenza to oppose his expected northeastward advance, he marched east instead, along the south bank of the Po, and so, on reaching Piacenza, he had turned all the Austrians' possible lines of resistance.

To gain this advantage he had not scrupled to violate the neutrality of the Duchy of Parma, in whose territory Piacenza lay, calculating that he might find boats and a ferry to compensate for his lack of a proper bridging train. However, this disregard for neutral rights had an ironically retributive effect. For when Bonaparte swung north against the Austrians' rear flank, the latter decided to retire without loss of time through an intervening strip of Venetian territory—thus saving themselves by following his example of disrespect for the rules of war. Before he could use the Adda as a river barrier across their line of retreat, the Austrians had slipped out of his reach, to gain the shelter of Mantua and the famous quadrilateral of fortresses. In the face of these stubborn realities, Bonaparte's vision of invading Austria within a month became a distant vista. Increasingly distant, because the French Government, growing anxious over the risk of the move and its own straitened resources, ordered him to march down to Leghorn, and evacuate the four neutral states on the way—which meant, in the language of the time, to plunder their resources. In that process, Italy was despoiled to such an extent that she never recovered her former state of prosperity.

From a military point of view, however, this restriction of Bonaparte's freedom of action proved the proverbial blessing in disguise, for by compelling him to delay the pursuit of his dreams, it enabled him, with the enemy's assistance, to adjust his end to his means—until the balance of forces had turned far enough to bring his original plan within practicable reach.

The generals in the army were overawed by the genius and the magnanimity of their young commander. They fully appreciated his vast superiority, and approached him with restraint and reverence. The common soldiers, however, loved him as a father, and went to him freely with the familiarity of children. In one of those terrific battles, when the result had been long in

suspense, just as the searching glance of Napoleon had detected a fault in the movements of the enemy, of which he was upon the point of taking the most prompt advantage, a private soldier, covered with the dust and smoke of the battle, sprang from the ranks, and exclaimed, "General, send a squadron there, and the victory is ours." "You rogue," rejoined Napoleon, "Where did you get my secret?" In a few moments, the Austrians were flying in dismay before the impetuous charges of the French cavalry. Immediately after the battle, Napoleon sent for the soldier who had displayed such military genius. Unfortunately, he was found dead upon the field. A bullet had pierced his brain.

Napoleon's military career was studded with victories because he had a dynamic personality, possessed great courage and decisiveness, was an outstanding exponent of the art of war, was able to undergo supreme physical stress, enjoyed legendary reputation among those he commanded, and was, in fact, a military genius. However, when he made certain mistakes at Waterloo, he paid dearly for flouting the very principles of war which, when successfully pursued, had given him his string of victories in the past.

However, despite his defeat at Waterloo, in Napoleon, France had given to the world a military genius who had won undying fame for his country and her Army.

Moltke

The supremacy that the Prussian Army attained among the European armies by 1860 was made possible only by its organization, by its peacetime training, and by the theoretical study of war which was brought to perfection in the half century before Sedan.

The new Prussian strategy sprang from an original interpretation of Napoleon's art of war. To most nineteenth century students of war, Jomini's writings seemed the last word on Napoleonic strategy. Napoleon himself had said that this man from Switzerland had betrayed the innermost secrets of his strategy but remarked that Jomini had set down only principles whereas genius worked according to intuition.

The new Prussian school of strategy created its own organization in the Prussian General Staff which became the brains and nerve center of the Army. The origin of the General Staff really goes back to about 1806 when Scharnhorst reorganized the Ministry of War and created a special division which was charged with the plans for organization and mobilization and with the peacetime training and education of the Army. Under the jurisdiction of this section came also the preparation of military operations by intelligence and geographical studies and, finally, the preparation and direction of tactics and strategy. As a Minister of War, Scharnhorst retained the direction of this section and exercised his strong influence on the tactical and strategic thought of the officers in it by training them in war games and staff maneuvers. It became customary to assign these officers as adjutants to the various army units which went far to extend the control of the chief of staff over all generals. The young men with the purple striped trousers carried strategic thoughts into all sections of the Army.

In 1821, the Chief of the General Staff was made highest advisor to the King in matters of warfare, while the Ministry of War was restricted to the political and administrative control of the Army. This decision was of far-reaching consequences since it enabled the General Staff to take a leading hand in military affairs not merely after the outbreak of the war but also in its preparation and initial phase.

Moltke was destined to take full advantage of the traditional ideas and institutions which were created during the wars of liberation. He was not a Prussian by birth. His father was an officer of

the King of Denmark who happened to be a German prince. Moltke was brought up as a Danish cadet, becoming a lieutenant in 1819. His experiences at school had been unhappy and his relations with his father not close; nor did service in the Danish Army hold out great prospects. In 1822, he applied for a commission in the Prussian Army in which his father had started his military career before transferring to the Danish Army. The Prussians put the young lieutenant through a staff examination and made him begin at the very bottom of the military ladder again. After a year, however, he was favored by admission to the War College under Clausewitz. In 1826, Moltke returned to his regiment for 2 years but most of this time was given to theoretical work, such as teaching officers of his division. In 1828, he was assigned to the General Staff to which he belonged for more than 60 years.

With the exception of 5 years as a lieutenant in the Danish and Prussian Armies, Moltke never served with troops. He had never commanded a company or any larger unit until the age of 65 when he took virtual command of the Prussian armies in the war against Austria. The years from 1835 to 1839 which he spent in Turkey as a military advisor to the Sublime Porte gave him some actual war experiences in the futile campaign against Mohamet Ali of Egypt. The Turkish commander threw the good advice of young Captain Moltke to the winds and Moltke saw war at its worst among defeated troops.

When he returned to Berlin, he never had a penny to spend. Dire need dictated his writing short stories for a popular magazine or historical essays in order to purchase mounts without which he could not expect a commission on the General Staff. He translated six volumes of Gibbon's history only to discover that his publisher was insolvent. It is impressive to see how the young Moltke wrestled with such materialistic problems and yet acquired education in such a spartan setting. His chief work in his early years was concerned with topography but he went beyond into all the other aspects of geography and penetrated deep into history. His learning and education were remarkably well rounded and with them grew his power of expression. Moltke became one of the foremost writers of German prose. He was conscious of the natural interrelation of generalship and statesmanship and took lively personal interest in politics. He abstained from active participation in political affairs and never questioned the powers in being.

In 1855, Frederick William IV made him aide de camp to his nephew Prince Frederick William, the future Emperor Frederick III. This appointment brought him into contact with the Prince's father, known as the Soldier Prince, who apparently discovered in Moltke talents which seemed to recommend him for the position of the Chief of the General Staff. One of his first actions in 1857 when he became Regent of Prussia was to appoint Moltke to this post, as he was more interested in the political and technical reorganization of the Army. The popular *Landwehr*—territorials or National Guard—was curtailed in favor of a greatly expanded standing army. This gave the professional royalist officer corps unchallenged control over all military establishments of the nation. The Prussian Parliament fought this measure. This conflict was still raging when the Battle of Sadowa was fought. The Parliament's opposition, however, broke down when Moltke's victories fulfilled the longing for German national unity. Moltke's successful strategy, therefore, decided two issues: first, the rise of a unified Germany among and over the nations of Europe; and second, the victory of the Prussian Crown over the liberal and democratic opposition in Germany

through the maintenance of the authoritarian structure of the Prussian Army. Prior to 1866, Moltke was little known in the Army. The supreme authority at that time was the Minister of War, Roon. Even during the Battle of Sadowa, when an officer brought an order from General Moltke to the commander of a division, the latter replied, "This order is all very well, but who is General Moltke?"

Soon after this, Moltke's rise to prominence among the advisors of the King was supreme. His aloofness from the political scenes in the years 1857-66 allowed him to give his undivided attention to the preparation of future military operations. He overhauled the plans which the Prussian General Staff had drawn up and began to study railroads before a single line had been built in Germany. By these means, troops could be transported six times as fast as the armies of Napoleon had marched and the fundamentals of all strategy—time and space—appeared in a new light.

In 1865, Moltke wrote:

The difficulties in mobility grow with the size of military units. One cannot transport more than one army corps on one road on the same day. It follows that the normal state of an army is its separation into corps and that the massing together of these corps without a very definite aim is a mistake. A continuous massing becomes, if merely on account of provisioning, embarrassing and often impossible. It makes a battle imperative and consequently should not take place for the moment if such a decision has not arrived. The massed army can no longer march, it can only be moved over the fields. In order to march, the army has first to be broken up, which is dangerous, in the face of the enemy. Since, however, the concentration of all troops is absolutely necessary for battle, the essence of strategy consists in the organization of separate marches, but so as to provide for concentration at the right moment.

An error in the original concentration of armies can hardly be corrected during the entire course of a campaign.

It is probable that Moltke already envisaged operations in which the concentration of the army would take place on the battlefield itself, thus discarding the Napoleonic principle that the army should be concentrated well before the start of a battle. Still, Moltke's direction of operations in the weeks before Sadowa did not disregard the Napoleonic rule from the very beginning. He could have drawn the armies together before the battle but decided later on to continue their separation and to achieve their union on the battlefield. After Sadowa, he summed up his ideas thus:

It is often better if the forces can be moved on the day of the battle from separate points against the battlefield itself. In other words, if the operations can be directed in such a manner that a last brief march from different directions leads to the front and into the flank of the enemy, then the strategy has achieved the best that it is possible to achieve and great results must follow. Great successes in war are not achieved, however, without great risks.

Beyond this stage war becomes a combination of daring and calculation. After actual operations have begun, our will soon meets the independent will of the enemy. We can limit the enemy's will if we are ready and determined to take the initiative but we cannot break it by any other means than tactics, in other words, through battle. The material and moral consequences of any larger encounter are, however, so far reaching that through them a completely different situation is created, which then becomes the basis for new measures. The commander is compelled during the entire campaign to reach decisions on the basis of circumstances

which cannot be predicted. All collective acts of war are, therefore, not executions of a premeditated plan but spontaneous actions directed by military tact. The problem is to grasp in innumerable special cases the actual situation which is covered by the mist of uncertainty, to appraise the facts correctly and to guess the unknown elements, to reach a decision quickly and then to carry it out forcefully and relentlessly. It is obvious that theoretical knowledge will not suffice and that here the qualities of mind and character come to a very practical and artistic expression, schooled by military training and led by experiences from military history or from life itself.

Moltke denied that strategy was a science and that general principles could be established from which plans of operations could be logically derived. Each situation called for a definition in terms of its circumstances and for a solution in which training and knowledge were combined with vision and courage. In Moltke's opinion this was the chief lesson to be derived from history. He believed that no staff or army maneuvers, indispensable as they were for training of staff officers, could put before their eyes as realistic a picture of the significant aspects of war as history was able to do.

The study of military history was made one of the central responsibilities of the Prussian General Staff and not left to a subordinate section. Moltke set a style by his classic monograph on the Italian War of 1859, first published in 1862, which aimed at an objective description of the events in order to draw from them valid, practical conclusions. The histories of the wars of 1866 and 1870-71 were later written in a similar manner under his direction.

Moltke took the view that strategy could benefit greatly from history, provided it was studied with the right sense of perspective. His own practice exemplifies the benefits which he derived from historical study. He knew, of course, of Napoleon's use of detached corps for attacks against flanks or rear of the enemy. These operations with detailed units, however, had not affected Napoleon's general principles of strong concentration and his belief in the irresistible power of central attack. The advantages of such a strategy had been great in the age of Napoleon but they had not shielded him against ultimate defeat.

Important as history was for the officer, Moltke pointed out that it was not identical with strategy. Strategy is a system of *ad hoc* expedients; it is more than knowledge, it is the application of knowledge to practical life, the development of an original idea in accordance with the continual changing circumstances.

Moltke refrained from issuing any but the most essential orders. "An order shall contain everything that a commander cannot do himself, but nothing else."

One of the chief reasons why Napoleon kept his army close together was his wish to keep all troops within the reach of his direct orders. Moltke's system of disposition in breadth made the central direction of the battle itself extremely difficult. He directed most movements in the war of 1866 from his office in Berlin and arrived on the theater of war just 4 days before the Battle of Sadowa. He confined himself very wisely to general strategic orders. To ensure an adequate and free execution of strategic ideas, army commands were created with the authority in tactical questions resting with the commanders, corps, and divisions.

Moltke's theories of war have won a permanent place in the annals of strategy.

Rommel

Rommel was born in 1891. As a small boy he was docile but not afraid of anyone. The family had no military tradition nor any friends in military circles. However, he joined the Infantry in 1910 at the age

of 19 as an officer cadet and was commissioned in the 124th Infantry Regiment in 1912 as a second lieutenant.

He was good at drill and got on well with his men. He neither smoked nor drank nor indulged in any after dark amusements. He was strong willed and never tolerated anything slipshod.

From the moment he first came under fire, he stood out as incredibly brave. At 0500 on 22 August 1914, he went into action against the French in the village of Bleid. He had been under fire for over 24 hours when he had to go forward for reconnaissance in thick fog. Around a corner, near the hedge surrounding a farm house, he saw the enemy, approximately a platoon in strength, standing on the road.

Should he go back and bring forward his platoon to engage the enemy or should he and his two scouts fire and take the enemy by surprise? The first decision in war is not easy to make. However, he did what he was to do again and again later. He, along with his two comrades, fired at the enemy platoon, about 20 strong. The enemy broke up and later Rommel's platoon cleared the village. His repeated acts of bravery finally won him the Iron Cross Class I, when, by crawling through a gap in a belt of wire with his platoon, he advanced nearly 100 yards into the main French position, capturing several houses and beating off overwhelming enemy attacks in the process.

In 1917, before capturing the strongly fortified Romanian position of Mount Cosua, he went without sleep for nearly a week and was severely wounded in the arm several days earlier by a bullet. In January of the same year, he lay in the enemy outpost line until 2200 one night in a temperature which was 10 degrees below the freezing point and then launched a surprise attack on the enemy and captured 400 of them, half asleep. He locked them up in the local church. His comrades used to say, "Where Rommel is, the front is." He seemed to have a sixth sense and was a tactical genius.

He was an instructor at the Infantry School for 4 years and commanded a mountain battalion at the age of 42. Two years later he went to Potsdam War Academy as commandant.

The same year, 1938, Hitler chose him as commandant of the battalion responsible for his personal safety.

In 1940, he took over the 7th Panzer Division which he commanded brilliantly in the blitzkrieg against France. He really made his name in North Africa where by dint of boldness and applying the principles of war intelligently he won some classic victories.

North Africa has always been a great battleground in history. Rome and Carthage settled their scores for the Mediterranean Empire and Belisarius fought his most spectacular campaigns there. Alexander established himself in Egypt. Her importance lies in its control of the Mediterranean Sea.

In 1940, there were nearly half a million Italians in Libya and East Africa. The British had only 36,000 troops and one tank division under Wavell in Egypt. Wavell ordered his troops to indulge in the strategy of exaggeration and make 1 man look like 12 and 1 tank, like a squadron. Despite this inferiority in numbers, the British attacked *a la* Marshal Foch who once said, "My right is exposed, my left is heavily attacked, my center is unable to hold, I cannot redistribute my forces. The situation is excellent. I will attack."

By 21 January 1941, Derna was in British hands and Benghazi had fallen by 6 February. Wavell's army of the Nile had advanced 500 miles in 2 months. He had beaten nine Italian divisions with his three and had captured 130,000 prisoners and vast quantities of equipment.

In the meantime, Rommel landed near Tripoli in command of the *Afrika Korps*.

Gradually, the British lost control of the situation and their stock slumped as rapidly as it had arisen—and then, there was consternation in Cairo—Benghazi was evacuated; the 2d British Armored Division was destroyed; the 9th Australian Division and the 3d Indian Motor Brigade were overrun; Bardia and Sollum were lost; the enemy was back on the escarpment; and shortly afterward Wavell was relieved of his command. Everywhere people in Egypt whispered to one another that the man responsible for all this was Rommel. He at once became a legendary figure, both among his own troops and the enemy alike. He did not drink or smoke and, like Napoleon, could do with little sleep, and snatched, whenever possible, a few winks, arising completely refreshed. He did not care much for food and was content to stay for a day in the desert with a packet of sandwiches or a tin of sardines. He insisted on being given the same rations as his men.

He was up by 0600 every morning. A stickler for turnout on parades, he let the *Afrika Korps* dress as they pleased in the desert. He never put on a steel helmet. He moved wearing a checked scarf around his neck in winter and always wore his Iron Cross under his scarf.

He flew his own aircraft, although he had no flying license. He used to descend in rear areas by surprise and once caught a colonel in bed after 0700. He roared at the culprit, "You damned lazy fox. Are you waiting for me to bring you your breakfast?"

His visits to forward areas were very thorough. He had a keen eye for the country and minor tactics and never missed a machinegun badly sited, vehicles in the wrong place, mines too obviously laid, and uncamouflaged observation posts. He frequently drew enemy fire when he would drive out for a mile or so into no man's land to look at his own positions, from the enemy's point of view.

In battle he was at his best. He was a natural leader and instinctively relied upon his personal leadership. He was the first to identify desert war with war at sea and to realize that no admiral ever won a battle from a shore base. He was, therefore, always forward during battle, knew the latest situation, and was able to reach quick decisions. In rapidity of decision and velocity of movement, he outclassed all his adversaries. He was an artful and cunning fighter. His main contribution to tank tactics was his use of a screen of self-propelled antitank guns behind which his Panzers advanced, withdrew, or refuelled. Repeatedly, British tanks were entrapped and led on to the guns in their attempt to close. Repeatedly, with his own armor concentrated, he caught the British dispersed.

His orders were often given verbally and were short and definite. He never had any doubts about what he wanted, and left none in the minds of his subordinates. He took great personal risks in battle. Again and again he was close to death or capture. Like Napoleon, he took risks because he had to and because he was convinced it was impossible for him to be killed in action. The key to his success lay in the encouragement he gave to his men which developed the will to win. His personal prestige was equally high in Germany and Africa. He was the *Afrika Korps*, to his own men and foes alike. It was he who taught them never to admit that they were beaten. It was because they were the *Afrika Korps*, that even when they were taken prisoner, they marched down to the docks at Suez with their heads high, still whistling, "We march against England today." In Germany to this day they still carry their battle signs in their pocket books and proudly recollect their African escapades.

Let us see how Rommel conducted some operations in North Africa. In March 1941, he counterattacked the British ad-

vanced dispositions and then by an encircling bluff enforced the surrender of their main body at Mechili. Within a week, he had swept the British out of all of Cyrenaica except Tobruk and only by overstretching his supply lines was he compelled to halt at the frontier.

In June, the British, having received reinforcements, attempted a fresh frontal offensive against the Libyan frontier. Rommel turned the tables by a well-judged armored counterstroke. In November, the British mounted a bigger offensive. By this time Auchinleck replaced Wavell as commander in chief and the Eighth Army came into being under General Cunningham. However, this time again they played into Rommel's hands by trying to smash his armor in head-on battles. As the German tanks were superior in gunpower, although not in mobility, they applied defensive-offensive tactics which lured British tanks into traps. As a result, the British lost their numerical superiority as well as the strategic advantage and Cunningham tried to break off the offensive. As this was repugnant to higher authorities, Cunningham was replaced by Richie.

At this juncture Rommel swooped around the Eighth Army flank and tried to cut its line of communications. He failed in this effort and in this process lost all of Cyrenaica. However, as soon as the British became overextended in their pursuit, Rommel struck back again.

For 3 months the front was stabilized on the Gazala position. In May 1942, Rommel moved first and by a wide flanking maneuver with his armor, threw the Eighth Army off balance.

General Richie had constructed a series of fortified posts known as boxes from Gazala to Bir Hachim. They were: in the north, the 1st South African Division; in the center, the 50th British Division; at Knightsbridge, the British Guards Brigade; and at Brittachie, the Free French Force.

The XIII Corps was to hold the boxes and XXX Corps was to destroy enemy armor and protect XIII Corps' flank.

The Germans had 6 Italian divisions, 3 armored divisions, 1 motorized division, and 1 light division. The British had 3 infantry divisions, 2 armored divisions, 3 infantry brigades, and 1 motor brigade. The Germans had 550 tanks opposed to the British 631. The British had air superiority.

Rommel concentrated his armor on 26 May without the British knowing of it until 27 May. He set out in three columns and, by the evening of 27 May, despite Royal Air Force intervention, he reached the outshirts of Acroma—Sidi Razegh. Between 28 and 31 May, fierce tank battles took place at Knightsbridge—known as the "Cauldron." Finally, on 1 June, Rommel's striking force stood poised in the two lanes they had cleared in the locality of the 50th Division. The Eighth Army counterattacked in the Cauldron area but without success. Rommel now attacked and captured Bir Hachim. On 10 June, the Free French withdrew and thus Rommel gained complete freedom of movement for his armored forces. Forces engaged on this flank were released for the main battle and the threat to his line of communications was removed.

After a series of tank battles in the Cauldron area, in which the British lost most of their tanks due to superior German antitank guns, Tobruk fell after the fall of Gambert, on 21 June.

The British had their forces in penny packets all over and had insufficient antitank guns. As each box was surrounded, armor had to be sent to its aid and was defeated in detail. Regrouping of the British armor and infantry took place too often. The morale of German troops was higher as they had advanced up to Gazala prior to this battle.

Despite air superiority, the British lost this battle as they had disregarded cer-

tain essential principles of war which Rommel observed with determination—surprise and mobility.

Rommel should have stopped at Tobruk. However, through political pressure, and through his own lust for gamble and success, he went beyond Tobruk and 4 days after the fall of this garrison he had reached Sidi Barrani and eventually stopped at El Alamein where the Eighth Army held fast to its ground. Alexandria was now only 65 miles away but Rommel had only 12 tanks left. For his success in this battle, he was promoted to the rank of field marshal at the age of 49. He had risen from lieutenant colonel to the highest rank in the Army in 5 years. That night he wrote to his wife, "Hitler has made me a field marshal. I would rather he had given me one more division."

Soon, British reinforcements arrived from England. Churchill wanted the British to take the offensive without delay, but Auchinleck, more wisely, insisted on waiting until the fresh troops had become tactically acclimatized to desert conditions. As a result, Auchinleck was replaced by Alexander as commander in chief and Montgomery took over the Eighth Army.

Rommel struck again at the end of August but was foiled by the British defensive tactics and in the process, the initiative changed hands.

After a long pause for thorough preparations—a longer pause than Auchinleck had contemplated—the Eighth Army launched its offensive in the final week of October at El Alamein. It was backed by a tremendous superiority in air, gun, and tankpower. Rommel's forces, besides being overtaxed, were crippled by heavy submarine sinkings of their oil tankers in the Mediterranean and their consequent immobility.

Rommel had 40,000 Germans, 50,000 Italians, and 500 tanks. The British had 110,000 men, 1,100 tanks, overwhelming artillery, and complete air superiority.

Montgomery held a short front from Ruweisat to Alam el Halfa, a distance of 15 miles. The Germans, on the other hand, held a 35-mile front with insufficient troops.

At 2140 on 21 October, supported by 1,000 guns, Montgomery advanced with XIII and XXX Corps simultaneously and occupied the Meiteiriya ridge by the morning of 24 October. Rommel launched a series of counterattacks but without avail. On 30 October, the 9th Australian Division attacked the coastal road but failed to reach the sea. On 2 November, the 2d New Zealand Division established a new corridor near El Rehman but suffered heavy casualties. Rommel counterattacked and a violent armored battle occurred near Tel El Aqqaqir which the Germans captured on 2-3 November. On 3 November, the Germans were driven out of the Tel El Aqqaqir area and began their long trek to El Agheila. Rommel suffered 59,000 casualties and lost nearly all his tanks and 400 guns as opposed to the British who lost 430 tanks and had 13,000 casualties. Montgomery's pursuit of Rommel was too cautious and his air did not maintain contact with the retreating enemy. Hence, Rommel got away lightly.

The reasons for Montgomery's success were his ability constantly to regroup his forces, the excellent concentration and location of his armor, the major surprise he sprang on the enemy by keeping the date and the direction of his attack a complete secret, and finally, the low morale of the Italians.

Rommel steadily withdrew past Tripoli and eventually in a vain but protracted attempt to arrest the Anglo-American advance from Morocco and Algeria, the *Afrika Korps* sang its swan song after a glorious struggle against overwhelming odds.

Rommel later became an army commander in Italy and in 1944 commanded an army group. He was severely wounded

as a result of being machinegunned by an enemy aircraft while he was inspecting the front in a jeep.

When the Allies' offensive began to overwhelm the Germans on the Western Front, he realized at once that continuation of war under the circumstances would only mean unnecessary slaughter of German manpower. He accordingly advised Hitler to sue for peace. His enemies misrepresented this to Hitler as a defeatist attitude. Steadily they mounted a "hate campaign" against him until they succeeded in having him murdered in cold blood.

Thus a pitiless destiny snatched away this great soldier.

The irony of fate was that two great generals like Napoleon and Rommel had fallen prey to political victimization.

Conclusion

The lives of great commanders, therefore, show that the qualities which distinguished them always remain the same. An outstanding general should be decisive, bold, energetic, popular, and lucky. He should overcome numerical inferiority by the concentration of troops, through mobility, and hence rapidity of movement at the decisive place and time: he should never give lengthy orders and must maintain high morale in his forces. He should be sound in administrative planning, improvising, and utilization of local resources. Finally, he must avoid arrogance in victory and dejection in adversity, for, in war, success and defeat follow closely on one another and make a continual ebb and flow.

Whether we study the battles fought by Caesar or recent ones we find that the importance of the fundamental principles of war such as the maintenance of the aim, offensive action, surprise, concentration, mobility, security, economy of force, morale, and administration is the same today as it has always been.

It is, therefore, necessary for all of us to study the careers of successful generals in history and observe how they upheld all the principles of war and essentials of leadership. The pattern of war has fundamentally remained the same throughout the vicissitudes of history. Masters of the art of war have, however, been few and far between and appear in our midst only once in a blue moon.

The Army and the Party in the Soviet Union

Translated and digested by the MILITARY REVIEW from an article by André Pierre in "Revue de Défense Nationale" (France) April 1955.

THE ministerial crisis precipitated recently by the dismissal of Georgi Malenkov, ended with the appointment of Marshal Bulganin as President of the Council and that of Marshal Zhukov as Minister of National Defense. For the first time in the history of the Russian Revolution, three "marshals of the Soviet Union" are occupying key posts simultaneously: Bulganin is chief of the Government, Zhukov is chief of the Army, and Voroshilov, as president of the Presidium of the Supreme Soviet is, in a way, chief of the Soviet State.

Outwardly, this promotion of the three marshals appears to indicate an extension of the growing influence of the Army in the direction of the affairs of state, and in some quarters the question has arisen whether the Army, more and more conscious of its strength, might not, some day, become a rival of the Communist Party

itself. In our opinion, however, hasty conclusions should not be drawn from the February crisis. First of all, it should be remembered that but one of these three men in uniform, namely Zhukov, is a career soldier. The other two are civilians who have never learned the profession of arms, and who never formed an intergral part of the Soviet Officers' Corps.

Political Marshals

Voroshilov and Bulganin are "political" marshals. The first is a former metallurgist from Lugansk, a Bolshevik revolutionist who fought courageously during the Civil War at the beginning of the Revolution. This militant Communist collaborated closely with Stalin in the fight against Trotsky, became a member of the Politburo in 1925 and at the same time, Peoples Commissar for Defense, and he was promoted to the rank of "Marshal of the Soviet Union" in 1935, at the age of 54. His concept of the Army has always been that of a "class army" called on to defend the social conquests of the Revolution. That the Army should serve the ambitions of a man and aid him in seizing power has always been counter to his ideology. An enemy of Bonapartism, he always distrusted officers who had begun their careers under the old regime and who were more or less imbued with cast spirit. It is true that in 1941 he was called on to command fighting forces and was charged with the defense of the northern front which the German army of General Leeb was attacking, but his military science was rather rudimentary and, beaten by the Wehrmacht, he was obliged to relinquish to others better qualified than himself, the winning of laurels on the field of battle.

Marshal Bulganin is still less a soldier than Voroshilov. During the greater part of his career he had discharged—and brilliantly—various civil functions and entered the Army only in the fall of 1941, but as a "political" commissar of the troops commanded by Zhukov. He never commanded fighting forces and was not, directly, one of the architects of victory. It was only after the hostilities that he became Minister of the Armed Forces—March 1947—and that he was promoted, on 3 November of the same year, to the post of "Marshal of the Soviet Union."

In short, Voroshilov and Bulganin are not out-and-out soldiers. Essentially, they are political personalities, "companions in arms of the great Stalin," who have climbed to the highest echelons of the hierarchy in the Communist Party and have always been champions of the predominance of the Party over the Army itself. Zhukov alone is an authentic marshal, the top spokesman for the Army and the most outstanding and popular personality in the Soviet Officers' Corps. On the basis of the fact that these three men occupy high posts in the Soviet Union today, the conclusion should not, however, be drawn that the "era of the marshals" has dawned.

Distrust Army

It is, however, nonetheless true that the promotion of Marshal Zhukov, the savior of Moscow and the conqueror of Berlin, to the Ministry of Defense—which controls both the Army and the Navy—is an event which should be stressed, an event which, without any doubt, could not have occurred during the lifetime of Stalin. Stalin had always been distrustful of the Army chiefs. Before World War II, he had liquidated the High Command. As a matter of fact, in 1937 and 1938, he had executed Marshals Tukhachevski, Yegorov, and Fedko, the greater part of the regional and army corps commanders, and the higher officers of the Navy and Air Force—all of them accused of conspiracy against the security of the State. It was the bloody period called *Yeyovshchina*, from the name of the great purger Yeyov,

that sadistic madman, who, himself, was to disappear mysteriously at the beginning of 1939. During the war, Stalin had the title of "generalissimo" conferred on himself, and it was to himself, above all, and to the Party, that he caused the merit for all the military successes to be attributed. He did everything in his power, after the cessation of hostilities, to reduce the popularity of the victorious marshals and generals and, especially, to dim the glory of the most illustrious of them—Marshal Zhukov. Seeing in him, doubtless, a possible rival, he removed him from Moscow, and Zhukov was allowed to return again only a short time before Stalin's death.

Although justified in 1937 and 1938, the fears of the dictator were without foundation after the war. It can be affirmed, today, that neither Marshal Zhukov nor the other military chiefs have had Bonapartist tendencies at any moment. The Communist Party could have confidence in them. They have been loyal toward it and toward the Soviet regime. Coming, for the greater part, from the worker and peasant classes, educated in the military schools and academies established after the Revolution, the superior officers possessed no caste feeling. The Supreme Staff did not feel itself to be any different, essentially, from those of the troop units and nursed no hostility toward the Party: Had not the latter had a purely national and patriotic attitude? Had it not pursued the same aim as the Party from 1941 to 1945—the expulsion of the German invader and the liberation of the national territory?

Both officers and soldiers had received the same political instruction in the schools and universities, that is to say, instruction conforming to the Marxist doctrine. There had been ample time for the Party to infiltrate the Army—long called the "Workers' and Peasants' Army"—since the 1920s, when it had consolidated its power over the entire country. This infiltration had occurred, naturally, from the top down. It was in the superior cadres of the Army that the greatest proportion of militant Communists was found to begin with, but from year to year, and more rapidly during the war as well as after the victory, the number of Communists in the subordinate cadres and even among the soldiers also increased. The barracks became natural hotbeds of communism and the Party opened its doors more and more widely to these simple indoctrinated soldiers.

This policy of infiltration into the Army actually was followed by surprising results. Molotov, himself, in his speech to the Supreme Soviet on 8 February alluded to it. He revealed that at the present time, in 1955, 77 percent of the Soviet soldiers are members of the Party or of *Komsomol* organizations—Communist Youth Organizations. This figure of 77 percent is more than three-fourths of the forces of the Regular Army.

If such a proportion of Communists exists in the troop body at the present time, it is probable that it approaches 100 percent in the case of the superior cadres: generals and marshals. Thus, the Communist Party and the Army are closely and firmly united. It is now unthinkable that the Army should constitute a threat to the Party. Amalgamation has been effected.

Central Committee

In converting the Army to communism, the Party gave a choice place to military leaders in its directive organ, the Central Committee. This was evident on the occasion of the Nineteenth Congress held in Moscow in October 1952. To this Central Committee, which constitutes a type of little "Communist parliament" of 236 members, were elected—in addition to Voroshilov and Bulganin—Marshals Vasilevski, Sokolovski, Konev, and Admiral

Nicolas Kuznetsov as regulars. Among the substitutes, we call attention to the names of Marshals Zhukov, Budenny, Timoshenko, Vershinin, Govorov, Malinovski, Meretskov, and Bogdanov as well as of several other high-ranking officers: Colonel General Artemev, General of the Army Bagramian, Admiral Bassisty, Colonel General Gorbatov, Colonel General Grechko, Admiral Yumashev, Colonel General Feodor Kuznetsov—who for a long time was Chief of the General Staff, Colonel General Zhigarev—subsequently promoted to Marshal of Aviation and Chief of the Air Forces of the Soviet Union, and General of the Army Chuikov—who commanded the occupation forces, is Chairman of the Soviet Control Commission in Germany, and is one of the heroes of Stalingrad.

In taking all these military leaders into the Central Committee, the Party showed

	Soviet of the Union	Soviet of the Nationalities
Bulganin		Russian Soviet Federal Socialist Republics (RSFSR)
Voroshilov	Leningrad	
Vasilevski		(RSFSR)
Zhukov	Sverdlovsk	
Budenny	Khmelnik	
Konev	Lvov	
Sokolovski	Stalingrad	
Timoshenko	Mozyr	
Malinovski		(RSFSR)
Meretskov	Kem	
Vershinin		Azerbaidzhan
Bogdanov		Byelorussia
Nedelin	Krasnoyarsk	
Govorov		Special military district
The Navy is represented by six admirals:		
Gorshkov	Sevastopol	
Golovko	Telsiai (Lithuania)	
Kharlamov	Pärnu (Estonia)	
Panteleiev	Maritime Province (Far East)	
Bassisty		Georgia
Nicolas Kuznetsov		Estonia

occupied the post of Political Director of the Army before he was replaced, in 1953, by General A. Zheltov, Colonel General Luchinski, Colonel General Malinin, Colonel General Maslennikov—commander of the special troops of the Soviet Ministry of Internal Affairs (*MVD*), Colonel General Nedelin—who in December 1953 became Marshal of Artillery, Lieutenant General Riabikov, Admiral Sakharov, General of the Army Shtemenko—who for a time

that it regarded them as excellent Communists and that it had full confidence in them. It is, however, no less interesting to learn that these leaders, heroes of the war, do not even have any part in the life of the Party. They have, however, in addition, been elected as deputies to the Supreme Soviet of the Soviet Union—the central "parliament" as well as to the Supreme Soviets of the various republics of the Soviet Union.

The Supreme Soviet of the Soviet Union which, as is known, comprises two houses —the "Soviet of the Union" and the "Soviet of the Nationalities"—was re-elected on 14 March 1954. Among its deputies, we find the group of chiefs who, in time of war, would have to command the forces of the Army, Air Force, and Navy. The table, page 95, shows their distribution in the two houses and indicates the regions or republics they represent.

Comparing this list with the previous one relative to the Central Committee of the Party, we see that these great leaders serve both as deputies and as members—regular or substitute—with the Central Committee. For the greater part, the same men have been elected to the local organs of the Party in the regions where they exercise their commands. Thus, Marshal Konev, who commands in the Carpathians, is a member of the Central Committee of the Ukranian Communist Party, and Marshal Timoshenko serves in the political bureau of the Party in Byelorussia.

The Supreme Soviet of 1954 opened its doors to a large number of generals who command the military units in very diverse regions of the Soviet Union. We have identified among them: Moskalenko, Commander of the Moscow region; Galitski (Odessa); Kazakov (Sverdlovsk)—in the same district as Marshal Zhukov; Zheltov, Chief of the Political Directorate of the Army (Moldavia); Eremenko (Rostov on the Don); Batov (Kalingrad); Frolov (Arkhangelsk); Luchinski (Uzbek); Plev (Azerbaidzhan); and Pukhov (Novosibirsk). In short, the Central Communist Party of the Soviet Union and the national parties in the Federated Republics have given a choice place to the military leaders. The military power and the civil power collaborate in the direction of public affairs.

There is, then, no such thing as rivalry between the Army and the Party. The thing that has brought them together, however, and the thing that has sealed their union, is their common distrust of another force which has been all-powerful since the beginning of the Revolution, namely, the political police under the *MVD* and the Ministry of State Security. This police force had been a state within a state; it had power of life and death over all citizens; it had been above the laws; and it maintained a watch over the activity of the members of the Politburo. The Regular Army was naturally jealous of the unlimited power of the police, who had enormous forces scattered over the entire territory. After the death of Stalin, the great crisis of June and July 1953 arose, when Beria, who had immediately pushed himself forward into second place before Molotov, plotted to succeed his Georgian compatriot, Stalin. The Army immediately lined up with the Party to crush his attempt to seize the dictatorship. It sent two armored divisions into Moscow to maintain order and crush any eventual resistance on the part of the police when Beria was arrested.

Fight the Police

It was with the full consent of the Army that they proceeded everywhere to dismiss Beria's henchmen. Several days after the sensational arrest of the latter, a gathering of the military chiefs took place at the Ministry of Defense with General Zheltov, Chief of the Political Directorate of the Army, presiding. After the reading of the report on the decisions made by the Central Committee of the Party, Marshal Bulganin, Minister of Defense, took the floor to approve the energetic attitude of the Party, and after him Zhukov, Budenny, Sokolovski—Chief of the General Staff—and still others spoke in the same vein. The motion unanimously adopted by the Army chiefs stated:

The Party organs of the Ministry, the Communists of the Army and of the Navy,

will continue in the future to be the faithful and dependable supporters of the Central Committee of the Party.

Is it not significant that the Party entrusted to Marshal Ivan Konev the task of presiding over the tribunal which condemned Beria to death for high treason?

Conclusion

Thanks to its loyality in these critical hours, the Army has won the gratitude of the Party. It aided the latter in establishing "revolutionary legality" and in ending the police terror which, over a period of many years, had claimed so many victims. What has been the result? The *MVD* which had always been presided over by one of the high dignitaries of the Party is no longer anything more than a ministry like any other, and an ordinary high police functionary, Serge Kruglov, has been placed at its head. The Ministry of State Security has been abolished and replaced with a "Committee of State Security" which has been placed in charge of another police functionary, Ivan Serov. Neither Kruglov nor Serov play an important part in the Government, and Marshal Bulganin, who on 8 February succeeded Malenkov as President of the Council, kept them in a subordinate position when he reorganized his cabinet, increasing the number of "first vice presidents" and "vice presidents."

In short, the Army plays a more important role in the state since the liquidation of Beria and his accomplices. Nevertheless, the fact must be recognized that the principle of the predominance of the Party over the Army still remains in force. The political marshal, Bulganin, has yielded his portfolio as Minister of Defense to career marshal, Zhuhov, and for the latter, it is unquestionably an important promotion for heretofore he had been only deputy minister, like Marshal Vasilevski. Bulganin, however, doubtless in accord with Kruschev—the Party head—did not yield to Zhukov his other title of "First Vice President of the Council." He did not even appoint him "Vice President." Zhukov, therefore, continued to hold the rank of an ordinary minister and was not admitted to the enlarged cabinet of 28 February, the new "Council of the Fourteen" which constitutes the real Government of the Soviet Union. It is to be noted, moreover, that in the Party, Zhukov is only a member of the Central Committee and that he has no chance of attaining the summit of the hierarchy, that is to say, of entering the "Presidium of the Nine."

In conclusion, are we to regard the growing influence of the Army and the promotion of Zhukov to the control of all the military forces of the Soviet Union as a good omen? Everything indicates that this influence will be exercised in the direction of an easing of international tensions. Zhukov, his deputy Vasilevski, and the other military leaders know better than anyone what World War II cost the country. They are naturally hostile to a policy of adventure or provocation although at the same time they are advocates of the industrial and military reinforcement of the Soviet Union. In this respect, moreover, they can rest satisfied, since the new budget for 1955 again placed the emphasis on heavy industry and increased the military credits. In the interview he had on 7 February 1955 with several American journalists, Marshal Zhukov expressed himself as follows:

We have everything that is necessary for the sure defense of our country, but we are likewise studying how to avoid war on the basis of the principle that even a poor peace is better than a good quarrel.

Also, the former companion in arms of General Eisenhower pledged himself to seek an amelioration of the relations between the Soviet Union and the United States.

March of an Armored Division During the Muddy Season

Translated and digested by the MILITARY REVIEW from an article by Dr. F. M. von Senger und Etterlin in "Wehrkunde" (Germany) March 1955.

THE following study will describe merely the peculiarities associated with the movement of an armored division during the muddy season. Tactical details, combat operations, and technical questions relative to engineer operations for the construction and maintenance of roads are not considered. Measures of this type played but an insignificant role. The absence of all suitable road materials in these regions made it impossible for the troops to improve the road conditions to any material extent. We shall further omit reference to the influence of railway transportation on the march movement. Especial emphasis is given, however, to the description of march procedures, vehicle operation, and the lessons drawn from them.

The examples given are typical of marches over the entire black-earth region, particularly that of White Russia, the Ukraine, and the regions between the Don and the Caspian Sea east of the Ukraine during the so-called muddy season. Similar conditions prevailed in the central and northern Soviet regions where the soft loess loam is found.

January 1944

The Sixth Army had the mission of maintaining possession of the ore deposits important to the German war industry in the Nikopol region of the lower course of the Dnepr. The Army front was divided into two parts by the Dnepr. East of the river, two army corps—about 10 divisions—held a bridgehead about 12.5 miles deep and 60 miles wide. This front ran roughly in a southwest-northeast direction and was supported on both sides by the trackless Dnepr plain. Adjacent to this on the north the Army held a position which extended in a gentle curve from east to west into the Krivoy Rog area. Here the distance from the main line of resistance was only about 19 miles. Strong Soviet attacks had been directed against both the bridgehead and the northern front. However, they had all been successfully repulsed.

Beginning where the line held by the Sixth Army ended, the Eighth Army's main line of resistance extended from the area north of Krivoy Rog to the northwest. At Kirovograd this front curved northward and reached the Dnepr between Cherkassy and Kiev where it joined the front on the left held by the First Armored Army.

In the middle of January a regrouping of Soviet attack forces was observed in the Sixth Army area. The Third Ukrainian Front was reinforced opposite the northern front of the Army. It was to be expected that the adversary would make a drive toward the south, along the Buzuluk sector, with the intention of reaching the Dnepr bend along the Army axis, and of cutting off the corps which were located in the bend east of there. The Army therefore, moved its most efficient reserve, the 24th Armored Division, out of the bridgehead and into the Mariupol-Ivanovka area 9.3 miles north of Sholokhovo where it was stationed as an Army attack reserve behind the XXX Army Corps.

At the same time the Soviet Ukrainian Front in cooperation with the First Ukrainian Front had succeeded in cutting off the salient on the left wing of the Eighth Army, and in encircling 10 divisions in a pocket west of Cherkassy. It became necessary to pull the Army's main line of resistance back south of Shpola-Sveningorodka.

Mission and Situation

On 27 January 1944 the 24th Armored Division received the mission to march to Novo Ukrainka by way of Sholokhovo, Krivoy Rog, Kasanka, and Bobrinets and to hold itself in readiness there for action to the north on the left wing of the Eighth Army. It was planned to re-establish contact with the isolated corps by means of combat.

The Division had been in action on the Eastern Front only 3 months following its organization. Its assignment of combat vehicles was 85 percent normal. Its armored vehicles had covered about 1,850 miles without a general overhauling.

The Division had approximately 30 different types of vehicles. The spare parts of these vehicles were not mutually interchangeable. The various types were also mixed within the units so that one squadron might have one *Maultier*, one 4-wheel drive, and one or more 2-wheel drive trucks in its train. The greater part of the supply units were equipped, however, with ordinary commercial trucks with 2-wheel drive.

The repair shop units were well equipped, yet the maintenance service did not possess enough towing equipment and the tractive power of what they had was calculated for loads on wheels.

This equipment was characteristic of the majority of the armored divisions located on the Eastern Front. The Division had captured a few American types of vehicles of lend-lease origin which also participated in the march.

The Division had already had experience on the Eastern Front and had gone through muddy periods several times before. It possessed a very good staff of drivers and technicians in both combat and supply units and its great defense successes of the previous 3 months had heightened morale. Both the command and troops were still convinced of the superiority of their own weapons.

The Division's prescribed march route led through that traditional black-earth region of the Dnepr plain. The black earth is a blackish, crumbly type of earth of great fertility. It forms a layer about 2 yards deep over the thick, lighter colored loess below it from whose weathering, together with an admixture of vegetable matter, it has been formed.

Soil Structure

The loess regions with their superimposed layer of black earth abound in enormous ravines which have been produced by water erosion. The majority of these have gently sloping edges, but in their centers have steep-banked channels which in some cases attain depths of as much as 125 feet. They alter their form with every summer downpour, widening especially toward their upper ends and pushing their lateral branches farther and farther into the surrounding plain. They constitute very considerable and dangerous obstacles which are difficult to overcome because they are usually not correctly indicated on the map, are almost indistinguishable across the flat expanse of the plain, and for the greater part are several miles long forcing vehicles to make wide detours.

In rainy weather and in periods of thawing temperatures the black soil softens in such a way as to form a deep stiff mud which is bottomless. In its frozen condition it is as hard as concrete. The properties of this mud are most troublesome during periods of continuous rainfall with freezing temperatures. It is then transformed into a tough mixture which sticks to everything and is hard to remove.

Because of the great extension of the loess deposit, there is an absence of building stone in the Ukraine. Also there are no woods or brush growth in any part of the black-earth region that could provide material for road construction. The houses are all built of straw and earth.

Road Conditions

Hard-surface roads constituted 7 percent of the total in the Ukraine. In the Dnepr plain region this percentage was considerably lower; the surfaced roads existing mainly in the industrial sections of the Donets region. Only main roads had a foundation filling with gravel surface. All other roads were dirt. These dirt roads which had been plowed, graded, and rolled were about 25 feet wide and in some cases had ditches along their sides.

All the roads were passable in dry weather. They develop a very heavy and fine dust. When rain falls they quickly become impassable—but dry out just as quickly when the rain ceases. During the muddy season these dirt roads no longer merit the name of roads. They become bottomless for a long period.

The prescribed march route involved the use of one of these dirt roads as far as Ustinovka. This stretch of road had been subjected to heavy traffic. It had already been so cut up that the exact trace it followed could not be determined. In some places it had been widened to several hundred yards. It led from Sholokhovo to Krivoy Rog, crossing several moist stream beds and ravines. Between Krivoy Rog and Kasanka it crossed several ravines of great depth. At the bottom of both the stream beds and ravines there were broad channels which were poorly bridged by emergency means. Many of these bridges were partially wrecked and some had even been pressed completely into the mud. From Ustinovka to Novo Arkhangelsk there was a main roadway, part of it having a firm filling. Where the filling was inadequate or lacking, however, the gravel surface of this road had been cut up and pressed down into the mud. In the ravines, because of the erosion effects, the filling was usually gone so that on this stretch of road there existed just as dangerous obstacles as over the dirt roads.

The stretch from Novo Arkhangelsk northward through Yampol was indicated on the map as a main roadway, but in reality it was a dirt road of especially poor construction.

Weather

January is the month of greatest precipitation in the Ukraine. There was an almost daily precipitation in the form of wet snow or rain. Only during the night did the temperature drop below the freezing point which caused the roads to freeze over for awhile. During the day heavy overcast skies alternated with warm sunshine.

This weather had the most unfavorable effect on the roads. When these were heavily traveled the freezing temperature had an even worse effect than the moisture, for in this case the deep ruts made the evening before froze solid, leaving the roads in such a condition that until they thawed out by noon of the following day it was impossible to travel over them—even for full-track vehicles. Relief was sought by blocking off the untraveled portions of the stretches of dirt roadway during the thaw period of the day so as to keep them smooth and passable when frozen. This was hard to manage, however, and impossible at narrow passages.

As a result of heavy traffic over the roads, the rain which fell during the day was deeply intermixed with the black earth and could not run off. Hence the stretches of roadway remained muddy much longer than the adjacent level terrain. For this reason new side roads were continually being started.

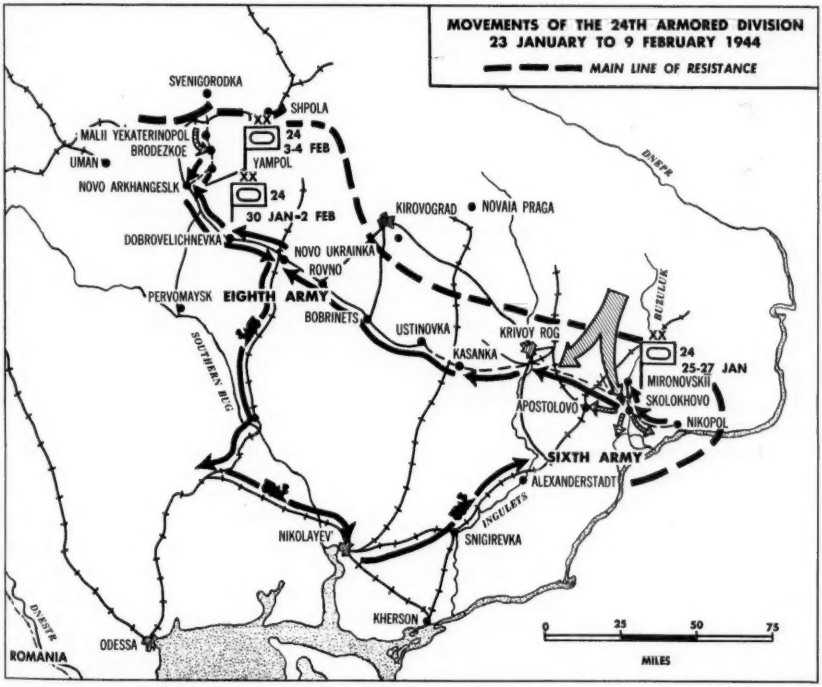
The March

The Division began its march on 28 January 1944 from its cantonment area north of Sholokhovo under the road and weather conditions described. For tactical reasons it was divided into six march groups.

The most capable of the vehicles of the first march group point reached Krivoy Rog in 15 hours, a distance of 47 miles. Because of the worsening of the roads the following march group attained a daily total of only 6.2 miles. Even full-track vehicles achieved an average speed of only 1.25 miles an hour. The majority of the vehicles remained stuck in the bottoms of the ravines and were unable to get out under their own power. The crossings were completely blocked by the succeeding march groups. The artillery on its way to be loaded for transportation received the order to load only the guns and to dispatch the tractors to the numerous ravines along the march route to pull out the stuck vehicles. When on level ground again, convoy trains were formed; that is, several vehicles were coupled together behind a vehicle which was more capable of operating in the mud.

During the night the vehicles froze fast in the bottomless mud. They had to be thawed out or dug out. Some of them had to be blown out by the use of explosives in order to take advantage of the frozen condition of the soil during the morning hours. As a rule, however, the freezing had not gone so deep that heavy vehicles could not immediately break loose. From the very start a systematic march order was impossible.

On the evening of 29 January the point reached Ustinovka; the main body Krivoy Rog. On 30 January the main road from Rovno aided the advance. By evening the point reached the assembly area about 19 miles north of Novo Ukrainka. The second march group with its leading ele-



ments was at Bobrinets, and the third at Ustinovka. The remaining march groups were completely intermixed. The ravines around Sholokhovo and Krivoy Rog were under heavy attacks from the air which in view of the massed condition of the vehicles caused heavy losses.

On 31 January the point of the second march group also reached the assembly area. Seventy percent of the vehicles of both groups remained behind strung out over the entire march route. The road conditions had become so bad that even full-track vehicles were stuck fast. Only the heaviest tractors were able to move. These pulled the vehicles one at a time to assembly places in the larger inhabited localities.

On 1 and 2 February 1944 the majority of the vehicles which were still able to move arrived at the assembly area one at a time. The armored personnel carrier regiment reassembled about 70 percent of its half-track vehicles. The divisional supply forces which were still in the Nikopol area could no longer be moved by overland march. Railway transportation could not be provided for them. Hence the Division headed for its engagement without supply forces.

On the evening of 2 February the Division received the order to prepare for the planned attack in the area north of Yampol. The night march again resulted in extremely heavy losses. Of the 192 vehicles of the armored personnel carrier regiment, 50 had to be abandoned on the stretch between Novo Arkhangelsk and Yampol. Even minor damage to the heavily loaded vehicles could not be repaired since the maintenance forces were far behind. In order to lighten the vehicles, their occupants went on foot. Groups of 20 to 30 men were formed who now and then pushed or pulled a vehicle. One fueling lasted a tank but a short distance.

On 3 February the concentration of the forces was continued in the area north of Yampol. Until noontime, however, only about a dozen tanks—out of about 50 which had begun the march—one battery of one complete regiment, and scattered infantry forces from the two armored infantry regiments and the engineer battalion which had managed to get there with or without vehicles were in condition for action.

In the journal of the Division we read:

The intention of the Division to push back the enemy—who thus far has occupied Malii Yekaterinopol with obviously weak forces—and again to seize possession of the railway line by means of a tank attack northward today has had to be abandoned since we have not been able to bring up the tanks, the roads being impassable even for them.

On 4 February the advance security forces knocked out three Soviet reconnaissance tanks. That was the sole combat action of the Division in the area of the Eighth Army at the objective point of its 8-day march, for on the evening of 4 February the Division received the order to return immediately to the area it had pulled out of a week previously.

Immediate Results

The cause for this new transfer of the Division was a change in the situation between Nikopol and Krivoy Rog. The anticipated enemy attack took place on 1 February. The IV and XXIX Guard Rifle Corps and the IV Motorized and Mechanized Corps of the Soviet Eighth Guard Army had broken through on both sides of the Buzuluk, had crossed the march route of the Division at Sholokhovo on 4 February, and taken Apostolovo. West of there the IV and XXX Guard Rifle Corps of the Forty-sixth Army had pushed southwestward in order to seize Krivoy Rog from the south.

In order to prevent the enemy from pushing farther southward, reaching the

Dnepr bend, and thereby encircling the Sixth Army, the Division was now to move to the area south of Apostolovo. It marched back to Novo Ukrainka on 5 and 6 February for entrainment. On this march about 50 percent of the vehicles remaining were lost. Only about 15 percent of them were loaded before the beginning of the march.

One immediate consequence of the impossibility of moving the final portions of the Division by a march overland was the loss of the greater part of its supply troops who had been caught in the enemy penetration. In this way the Division lost 1,958 vehicles, that is, 55 percent of its complement. The majority of the engineer vehicles, those of the signal battalion and those of the administrative forces, were lost. In addition half of all the workshop units and the supply forces, 13 guns, 13 antiaircraft guns, as well as numerous other weapons were lost, being abandoned along the march route.

Counteracting Measures

On 8 February a check showed that a total of 335 vehicles, although still capable of operation, were stuck in the mud between Novo Ukrainka and Krivoy Rog; 159 damaged vehicles were undergoing repairs; and 1,659 officers, noncommissioned officers, and men were left behind on the road because they had no means of transportation or the ability to make the march on foot. There was also an additional 15 percent of the vehicles which, although they had not fallen into the hands of the enemy, still would not be available to the Division in the foreseeable future.

Thus without these the combat value of the Division had been reduced by approximately two-thirds.

In order to counteract the unfavorable consequences of the march the Division first established salvage stations in Krivoy Rog and Novo Ukrainka. Little by little the vehicles that were still stuck fast in the mud were towed there. They were placed under the command of officers from the various units. For example, the light armored personnel carrier battalion left a squadron in Novo Ukrainka. With it were about 20 armored personnel carriers belonging to the battalion that could be put into running order again with the means at the disposal of the repair detachment. About 10 armored personnel carriers were so badly damaged that they could be repaired only by the rear echelons. Ten additional armored personnel carriers were towed in gradually.

The Division established a salvage area in the rear army area north of Odessa. It was under the command of a staff officer. All vehicles, regardless of whether they were in operating condition or in need of repair, were brought here from the salvage stations by rail. At that time this area, which was about 185 miles behind the front, seemed far enough away to ensure sufficient time for the repair of the vehicles.

Likewise during the succeeding weeks all of the Division's vehicles not directly required for combat duty were dispatched overland under their own power to this area. This plan was only partially successful, however, for during February the entire front had to be drawn back with ever-increasing speed and the muddy season continued unabated.

The Division made great efforts to put horse-drawn vehicles into operation for supply purposes. This proved inadequate, however, for supplying fuel to the tanks which were still in action. During the withdrawal operations of succeeding weeks, almost all the vehicles that were still with the Division but which were idle either because of minor damage or because they could not be pulled out of the mud had to be destroyed. In March the Division with a fighting strength of about 4,000 men made the return march

from Ingulets to Romania without a single vehicle.

The vehicles were then brought from the Odessa salvage area to Romania, and the Division again with their help acquired a measure of mobility. Without these foresighted measures which, generally speaking, were not ordered and only silently consented to by the higher commands, the Division would not have been able to save those vehicles it still had after the fateful march.

Tactical Lessons

This example shows what serious consequences a false estimate of the situation, insufficient knowledge of what is technically possible, and what disregard of the factors of terrain and weather by the responsible higher command can have.

The employment of armored divisions with the equipment available at that time was something which one could not successfully guarantee. The minor tactical successes that could have been won and were won by their use bore no justifiable relation to the unavoidable sacrifice of matériel. The depreciation of matériel that was not designed for such use constituted a waste of strength which was lacking later in a decisive place. We shall not, however, speak further here concerning the decisive defects of an inflexible system of warfare—which was the real cause of this waste. The measures taken by the Division are only an example of the benefit to be derived from a timely withdrawal from a dangerous zone. The combat report of the Division condenses the experiences of this period into the sentence: "Mud is the greatest enemy of the armored division."

Except for these general considerations, however, the shifting of the Division, even in this special case, was by no means in harmony with the requirements of the situation. In the Sixth Army's area any withdrawal of forces was extremely serious. The Army combat report noted with regard to this point:

The combat capacity of the Sixth Army was affected in a definitely decisive manner when on 28 January, 2 days before the beginning of the Soviet breakthrough attack, the 24th Armored Division was called away and sent off on a 150-mile march because of a change in the situation on the right wing of the First Armored Army. As a result the strongest link in the chain of the Army reserve was removed without its being possible to replace it in time with another of anywhere near equal strength. In addition to this the road conditions were already such that movements could be carried out only at speeds of about 5.5 miles an hour, and with heavy losses of equipment. In the case of the 24th Armored Division there was no guarantee that it would arrive at its destination in time with all its elements.

Summarizing, we read further:

Even after the proposal (to pull the front back) had been rejected and it was recognized that the enemy was shifting his main effort to the northern front, the Army's operational capabilities, fundamentally, still promised success in the defense battle. The 24th Armored Division at Ivanovka and the armored reserve group at Marevka lay like a protecting wall immediately behind the sector against which the Soviet attack was directed. When the Soviet IV Motorized and Mechanized Guard Corps broke through on 1 February, it would have been squarely in front of the guns of the 24th Armored Division without the latter's having had to move a foot in the deep mud. As a result of the forced removal of the 24th Armored Division and of two other divisional units 2 days before the beginning of the attack, the backbone of the Army's northern front was broken at the decisive moment. . . .

In the Eighth Army's area, however,

the action of the Division after its march through the mud could have been of no decisive influence. Supplies had been inadequate for a long time and it would have been absolutely impossible to move the Division's supply centers in time by an overland march. The demands of such a march would have been so far beyond the capacity of the supply centers' equipment, that it would have had to drop out in a short time. The tanks had already passed the critical point of motor wear. In the theater of action at that time the striking power of the Division could not have been exploited, since under the prevailing terrain conditions mobile operation was impossible. The Division would only have been able to develop the striking power of a weak infantry division. It would not have been different even if all the elements of the Division had been transferred to the Novo Ukrainka area by rail.

Thus as the result of a wrong decision, a division which had not lost over 3 percent of its mobility in 3 months of the hardest fighting had been reduced to a third of its value without having won the least tactical success by this sacrifice.

The following lessons may be drawn from these experiences:

1. Motorized and mechanized formations whose vehicles are not especially constructed for operation in mud are to be regarded as practically immobile during the muddy season. They should be drawn far enough back to be beyond the reach of possible enemy attacks before bad weather sets in.

2. If, exceptionally, such formations have to be moved in mud, measures must be taken for ensuring continuity in the march movement. Account must further be taken of the fact that there will be many vehicles lost during the march, that the marching formation will be badly strung out, and that one will not be regularly supplied by one's supply service.

3. The commander of the march formation will exercise the function of a traffic control officer for the entire duration of the march. His combat post, as far as possible, is to be situated midway along the march route. At narrow passages, bridges, or at other troublesome points he will station sector traffic control officers.

4. These sector traffic control officers are to be assigned towing detachments with vehicles especially capable of operating in mud, repair units, engineers, labor forces, military police, security forces, and signal communication apparatus. These forces for ensuring success on the march are to reach the various sectors before the main body of the formations that are to be moved.

5. The sector traffic control officers will be responsible for ensuring the quickest possible passage of the march groups through their sector. They will tow stalled vehicles especially in the vicinity of narrow passages and obstacles of various types. Damaged vehicles will either be repaired on the spot by the repair service of the sector traffic control officer or be towed away to salvage points where they will be taken over by the repair services of the various march groups.

6. The sector traffic control officers will maintain constant contact with the main traffic control officer. The march groups are under orders of these control officers while passing through their sectors.

7. The march forces will be divided into as many march groups as possible. Vehicles capable of operation in mud are to be distributed equally among the groups except for those assigned to the sector traffic control officers. All trains are to be placed directly with their units. Measures are to be taken to make frequent refueling possible.

8. The march is to be executed after the pattern of the block system with central direction. In order to prevent traffic jams at narrow passages the march groups

will be so moved from sector to sector that succeeding march groups will not arrive at narrow passages before all vehicles capable of operation of the preceding group have passed them.

9. The sector traffic control officers will not be removed until all vehicles capable of operation have passed through their sector. March formations cannot be regarded as ready for action at the march objective until all their supply services and the many valuable forces employed for their security on the march have reached the new area.

Technical Lessons

Lack of ability on the part of their vehicles to operate under such terrain conditions was the principal reason for the heavy losses to which motorized and mechanized formations were exposed in the black-earth region during the muddy season. However, because designs capable of satisfactory operation under such conditions are entirely possible, we shall for the sake of completeness take a glance at the experiences of that time with the unsatisfactory German equipment. Numerous formations of NATO are probably equipped with matériel which does not meet the requirements for operations in mud any better than the German equipment.

Wheeled Vehicles.—The light *Volkswagen* personnel carrier because of its light weight could be moved by the personnel it was transporting in case it stuck in the mud. Its power was inadequate, however, and its chassis unsuitable for operation in mud. The amphibious *Volkswagen* was relatively satisfactory. Its 4-wheel drive and, above all, its greater clearance and smooth underside gave it a relatively large degree of mobility. A few captured United States jeeps were tested. In spite of their greater power and 4-wheel drive, they proved to be inferior to the amphibious *Volkswagen* since their clearance was much too low. Despite the fact that their wheels continued to turn, they stuck fast in the mud and because of their weight could not be moved by their crews.

The 4-wheel drive heavy personnel carriers, *Kfz. 70s*, did very well. Their main difficulties lay in too light construction of certain parts such as clutch and differential.

Trucks without 4-wheel drive were immovable. The unfortunate concentration of weight on the rear axle of these commercial type vehicles, and their dual wheels were especially troublesome. The stiff mud stuck on these wheels in a thick layer. They turned only for a short time until the mud built up on them to such a thickness as to rub on the frame of the chassis, thereby stopping them.

The 4-wheel drive *Opel* personnel carriers were more mobile but suffered from the same defects as the commercial types. A few captured United States personnel carriers were more mobile because of their robust construction and greater power. The dual wheels of their rear axle were of no advantage. The large single wheels these types formerly possessed should meet all requirements.

The 8-wheel armored reconnaissance car was most mobile of all in the mud. It was even able to develop considerable speed. Larger wheels somewhat clearer of other parts would have increased its ability still more.

Half-Track Vehicles.—The chassis of all the tractors proved less suitable for operation in mud than those of some of the wheeled vehicles. The boxed in type of running gear employed is absolutely unusable in mud. The undriven bogie wheels were immediately stopped by the mud. The vehicles ran for long distances with clogged bogie wheels around which the track, greased with mud, merely slid. This, however, cut the rubber facing of the bogie wheels to pieces. The forward end

of the vehicle chassis which carried the front wheels was entirely too weak. Response to steering in thin mud was insufficient. Only the heavy 18-ton tractors with their large bogie wheels which were about 3 feet in diameter were entirely practical.

Again because of its greater power and robust construction, the American half-track vehicle *M2* was more satisfactory than the German types. Its small bogie wheels, however, were impractical in mud and its rubber tracks were often stretched by mud accumulations to the point where they broke.

The *Maultier* truck type vehicles were essentially capable of operation in mud. Because they were actually of emergency construction, employing obsolete light tank chassis, these vehicles suffered from numerous technical shortcomings. The heavy *Maultier* was especially practical. It was the sole vehicle that could definitely be said to be suited for operation in mud.

Full-Track Vehicles.—The German tank types all suffered from too small a power weight ratio. The bogie wheels were too small and the tracks too narrow. Because of too high a specific ground pressure, the tracks frequently sank into the mud although they continued to turn. Their high speed motors wore rapidly. Only the 38-ton chassis proved satisfactory to a sufficient degree. Its four large bogie wheels cut cleanly through any mud.

Men, like the tools of war, must be kept in a state of readiness. The individual officer or enlisted man who lets himself "go to pot" physically is as guilty of sabotage as some convicted fifth columnist. In this atomic era it can be assumed that in the event of hostilities there will be no "breather" in which men who have grown soft can be reconditioned.

The early days of the Korean conflict clearly indicated that few officers or men were physically combat-ready—both in the combat arms and technical services as well. The resulting casualties and decrease in efficiency left much to be desired.

Combat makes great demands on officers and men. It takes tremendous physical endurance to withstand fatigue, to function properly in spite of near-exhaustion. In Korea the Army faced an enemy skilled in ambush, infiltration, and guerrilla tactics. Experience there proved beyond any doubt that mental and physical alertness is as imperative in the rear of a battlefield as at the front.

If this were evident in a conflict with conventional weapons, it will be doubly true in any conflict in which atomic weapons are employed. Leaders in both the combat and technical branches of the Army can expect to operate independently at great distances from "home base." These leaders must be men who can operate for extended periods under conditions unknown in the past. With good health and physical conditioning (as well as technical and tactical know-how) will come the confidence necessary for success.

Brigadier General Carl F. Fritzsche

BOOKS OF INTEREST TO THE MILITARY READER

CHINA AND THE COLD WAR. By Michael Lindsay. 286 Pages. Cambridge University Press, New York. $3.75.

BY LT COL WILLIS B. SCUDDER, *Arty*

Mr. Lindsay has considerable background and experience with China and her people, and attempts to answer three important questions about the Chinese Communist Government in this book.

First, does the evidence support the Chinese Communists' claim to be acting rationally for peace? Second, does the policy of the Chinese Communists indicate that they do not want peace, or does it show that they are not acting rationally? Finally, there is the question as to whether anything can be done to reduce the threat to peace from such irrational behavior on the part of the Chinese Communists.

To attain a status of peaceful coexistence, Mr. Lindsay feels the Chinese Communists must no longer operate in terms of delusions about the outside world. Rather they must face the situation squarely seeing the world as it is and not as their Marxist-Leninist philosophy says it should be. The United States he feels must not attempt to block Communist Chinese aspirations in regard to a seat in the United Nations, nor should she "Continue support for pinpricking military attacks from Formosa."

This book proves a most interesting statement of the opposing positions, as seen by Mr. Lindsay, taken by Communist China and the Western World in this so-called "Cold War."

AMERICAN MILITARY POLICY. By C. J. Bernardo and Eugene H. Bacon. 512 Pages. The Military Service Publishing Co., Harrisburg, Pa. $5.00.

BY LT COL SAMUEL G. KAIL, *Inf*

This is an excellently written and extremely readable account of the development of American military policy from 1775 to the present day.

Doctors Bernardo and Bacon have tied their subject to the framework of each conflict that our Nation has engaged in from the Revolution through the Korean conflict. The military policy such as it was prior to the War for Independence, as well as the successive developments that have occurred during and after each subsequent war, are fully explained in this volume.

The indifference of the country to things military during peaceful years, the mistaken belief that the Nation can and will spring to arms overnight, the general abhorrence of the people of the country of a strong military force in being, and the inclination of Congress to make the Military Establishment a political football have remained constant throughout our history. With this attitude on the part of the people, their legislators, and to an extent the military, it is indeed remarkable that the United States has fared so well in its struggle for survival.

American Military Policy should be on the bookshelves of service school libraries since it includes in one volume a very interesting and carefully documented study on this timely subject.

LINCOLN AND THE PARTY DIVIDED. By William Frank Zornow. 264 Pages. University of Oklahoma Press, Norman, Okla. $4.00.

BY LT COL THOMAS O. BLAKENEY, *Armor*

Students of Lincoln's life and those interested in the politics of the 1860s will find this book quite interesting.

Toward the end of the Civil War Lincoln was in real political trouble. After the three bloody and indecisive years of war against Jefferson Davis' South, Lincoln was faced with declining popularity and economic problems of large measure. Many of his former supporters felt he should step aside and not run again. These people were agitating for a successful military man to replace him on the ticket. Lincoln would not accept the thesis that he could not win. Almost singlehandedly he reunited the North politically and saved the Nation as we now know it by defeating the advocates of the idea of "separation and peace at any price." The book is supported by an imposing bibliography.

YOUR ASSIGNMENT OVERSEAS. By Vernon Pizer and Perry Hume Davis, II. 291 Pages. W. W. Norton & Co., Inc., New York. $3.50.

BY LT COL GREY DRESSER, *Armor*

Advertised as "A handbook for the serviceman and his family," the authors attempt to answer the hundreds of questions which beset the military family about to go overseas. Separate chapters describe every overseas station manned by the Army, Navy, Marines, or Air Force and provide a variety of helpful information not available in any other single source. Covered are answers to such questions as: Are refrigerators issued in Vienna? Rugs in Berlin? Are there free schools for the children? Do commissaries stock Sanka and girdles?

The authors have 24 years of active professional service and have been stationed in all but one overseas command of which they write.

PERSONAL AFFAIRS RECORD BOOK. 64 Pages. The Military Service Publishing Co., Harrisburg, Pa. $1.00.

BY MAJOR JOHN J. EARLEY, *Inf*

This is a handy medium for use by the serviceman in recording significant data concerning himself, his family, and his belongings. Pages are provided for family and military statistics, medical records, finances, taxes, insurance, property, survival benefits, reference notes, and other items. It makes vital statistics immediately available if properly maintained.

THE NAVAL OFFICER'S MANUAL. By Rear Admiral Harley Cope. 608 Pages. The Military Service Publishing Co., Harrisburg, Pa. $4.00.

BY CAPT WILLIAM P. WOODS, *USN*

This book places under one cover many of the guides, manuals, pamphlets, and other publications that the junior officer in the Navy finds necessary as a guide. Its purchase is not recommended by the Army officer unless service with the Navy is contemplated.

WEYERS FLOTTENTASCHENBUCH 1954-55 (Weyers Fleet Manual 1954-55). Edited by Alexander Bredt. 350 Pages. J. F. Lehmanns, Munich 15, Germany. $6.19.

BY LT COL C. A. CHRISTIN, JR., *Arty*

Written in German this book gives detailed information concerning all of the world's war vessels and is supplemented by nearly 800 sketches of war vessels of military significance. It contains a historical section which gives the losses of the various fleets with data concerning time, place, and cause of sinking and the characteristics of the vessels sunk.

THE WOMEN'S ARMY CORPS. United States Army in World War II. By Mattie E. Treadwell. 841 Pages. Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. $6.25.

FROM LEXINGTON TO LIBERTY. By Bruce Lancaster. Edited by Lewis Gannett. 470 Pages. Doubleday & Co., Inc., Garden City, New York. $6.00.

BY LT COL JAMES A. SUTTON, *GS*

Doubleday's "Mainstream of America Series" has made available another excellent and very readable historical work. Although this narrative is primarily directed at the weekend reader, its refreshingly novel-like portrayal and authenticity will recruit many new devotees to future efforts in the historical area.

Bruce Lancaster is excellently gifted and equipped to produce this quasi-military-historical effort. His professed aim is to provide the reading public with a bridge between the stereotyped public school approach to early American history and the morass normally encountered in the documented works of required reading emanating from more august precincts. This reviewer wholeheartedly subscribes to the opinion advanced by other reviews, historical societies, schools, and the laity that the author has successfully accomplished his avowed intention. The book is not only interesting and educational, but is also an exceptional rarity for a successful attempt dealing with history—it is aimed at a level that will allow wide enjoyment and still it is not under consideration for "ban" even in Boston.

From Lexington to Liberty adheres to its eye-catching title. The opening pages briefly, yet adequately, review the international situation in 1764. The reader is then launched into the middle of the colonists' difficulties of the pre-Lexington period, through the sieges of Boston, New York, and Charleston, the capitulation of Cornwallis at Yorktown, Carleton's evacuation of New York, and concludes with Washington relinquishing command of the continent-army in Fraunces Tavern on Pearl Street, New York City.

The fact that several chinks exist in Mr. Lancaster's literary and historical armor must be acknowledged, but these are of such an inconsequential nature as to be quickly disregarded.

He brings early American history to us at its best in *From Lexington to Liberty*. In the event the reader has difficulty picturing himself reading late into the night on a history book—here is a challenge.

THE PSYCHIATRIST AND THE DYING PATIENT. By K. R. Eissler. 338 Pages. International Universities Press, Inc., New York. $5.00.

BY CAPT WILLIAM R. PERL, *MSC*

From the title this seems to be a book of very specialized interest; however, military personnel in combat areas are often confronted with the problem of how to deal with a dying comrade. It is written by a psychoanalyst and probes into the complex processes of feelings and thoughts of a person who first suspects and then knows that his "number is up." It is not a book for those who are not ready to devote much thought and time to this specific problem. For those who are ready to devote the effort it will be a fascinating book, even if they are not professionally trained in reading psychiatric literature.

AN OUTLINE OF ATOMIC PHYSICS. By Oswald H. Blackwood, Thomas H. Osgood, and Arthur E. Ruark. 501 Pages. John Wiley & Sons, Inc., New York. $7.50.

BY LT COL FRANCIS R. SULLIVAN, *CE*

This is the third edition of a text on Atomic Physics incorporating lecture material from a third year course given at the University of Pittsburg. The book has benefited from over two decades of "shake down" in actual use at Pittsburg to eliminate the extraneous and to include pertinent reference data. It is a good text both for college student instruction and as a review and reference for those acquainted with the subject.

LIFE AND ADVENTURES OF JOAQUÍN MURIETA. By Yellow Bird (John Rollin Ridge). 159 Pages. University of Oklahoma Press, Norman, Okla. $2.00.

BY LT COL E. VANRENSSELAER NEEDELS, *CmlC*

The myth of Joaquín Murieta, first told 100 years ago, is today a thrilling classic of western America. Based upon the California career of a Mexican bandit, each page of the story drips with blood and thrills with chases and hairbreadth escapes.

According to the story Murieta turned bandit because of ill-treatment suffered at the hands of Americans. He contracted a hatred of the entire American race, and was determined to shed their blood, whenever and wherever an opportunity occurred. Collecting a hardy band of cutthroats, including the infamous "Three-Fingered Jack," Joaquín Valenzuela, and others of equal disregard for life and property, he achieved his purpose over the length and breadth of California.

The death and depredation they wreaked finally aroused the people of the state to cause the Legislature to employ Captain Harry Love to capture, drive out of the country, or exterminate the highwaymen.

Of no less interest than the story is the introduction by Joseph Henry Jackson. He relates some of the background of the author, a half-Cherokee, who perhaps was incited to write the story by his own history. Ridge's father and grandfather were both assassinated during the Indian Removal to present Oklahoma. After killing a man he fled to California and there wrote of Joaquín Murieta.

Apparently Ridge received little reward for his effort despite the fact that his story has been retold by various plagiarists and made into a movie.

POWER AND POLICY. By Thomas K. Finletter. 408 Pages. Harcourt, Brace & Co., New York. $5.00.

SOVIET MILITARY LAW AND ADMINISTRATION. By Harold J. Berman and Miroslav Kerner. 208 Pages. Harvard University Press. Cambridge, Mass. $4.50.

BY COL HOWARD S. LEVIE, *JAGC*

This little volume will go far toward filling a void in our knowledge of an all-important facet of Soviet military life. While the portion of the book relating to military administration can, without too much difficulty, be culled from other publications, the portion relating to military discipline and law is probably unique. This is particularly so since it is written for and easily understood by the layman.

Of particular interest to those who have seen the United States Army pass through the postwar stage of so-called "democratization," as a result of the findings of the Doolittle Board, is the history of the "caste" system as employed in the Soviet Army.

In these days of the "cold war" we would all do well to study and to get to know as much as possible about the Soviet Army and what makes it tick. With regard to the basic matter of discipline a few interesting hours with Berman and Kerner will do much to make you understand the philosophy behind the administration of discipline in the Soviet Army from "company punishment" to trials for the most serious offenses.

THE MIDDLE EAST. Problem Area in World Politics. By Halford L. Hoskins. 311 Pages. The Macmillan Co., New York. $4.75.

THE UNITED STATES AND INDIA AND PAKISTAN. By W. Norman Brown. 308 Pages. Harvard University Press, Cambridge, Mass. $4.50.

STRESEMANN AND THE REARMAMENT OF GERMANY. By Hans W. Gatzke. 132 Pages. The Johns Hopkins Press, Baltimore, Maryland. $3.00.

U. S. MILITARY DOCTRINE. A Study and Appraisal. By Brigadier General Dale O. Smith, United States Air Force. 256 Pages. Duell, Sloan, & Pearce, New York. Little, Brown & Co., Boston. $3.50.

BY MAJ JOHN H. CUSHMAN, *Inf*

If anyone is in a position to set forth the Air Force point of view on the military doctrine suited to the United States in this age it is the author of this book. He has spent many years on the faculty of the Air University during the period when postwar Air Force doctrine was being formed. He is now serving on the Operations Coordinating Board of the National Security Council.

The evident authenticity of the doctrine, and its apparent influence on national policy, require that the educated professional soldier study this book.

General Smith presents an air-oriented doctrine that is persuasive and well documented. The Air University, other universities, and the Rand Corporation have evidently undertaken much basic research on air warfare, the fruits of which are apparent in this book.

The author is not content with generalities. In fact he relates how he would have applied this doctrine in 1950 when the North Korean armies invaded South Korea. There is a remarkable parallel between his hypothetical handling of Korea in 1950 and what evidently was the national approach to the Formosa problem early in 1955, a similarity such as to lead one to deduce that much of the doctrine may already have been incorporated into national policy.

In General Smith's concept there is little place for land forces as such; they are visualized as mopping-up forces, used to clinch a decision already reached by airpower. This raises a grave question requiring an objective answer: *Is the doctrine valid?* Its acceptance, if not valid, could lead close to disaster.

Validity is hard to establish. One cannot ask if this doctrine has been tested because doctrines tested under conditions of the past may well be false today. One can only ask if the reasoning is sound, if past experience is being accurately extrapolated into today's situation. Are the makers of this doctrine properly applying to the megaton era the true lessons of Truk, of Pantelleria, of the World War II bombings of Japan and Germany, and of the 1921 experiences of the British subduing Arab tribes by air? Do the makers of this doctrine read correctly the probable behavior of peoples and systems under nuclear attack, the reaction of the unattacked world thereto, and the reaction of the American people and defense system to retaliation in kind?

One might also ask if all the alternatives have been considered. In their single-minded devotion to the air weapon, have these strategists neglected more effective means of forcing the national will upon the enemy?

This is the air-atomic age, separated by probably only a few decades from the age of space travel. The pace of evolution is swift; victory will go to the side which has made the most accurate evaluation of every significant factor. National destruction may be the price of error.

The Army has both an obligation and an opportunity along these lines. The obligation is to put forward alternate solutions of equal or greater merit if such exists. The opportunity is to bring a fresh, scholarly point of view into the highest councils of the Nation.

THREE LINCOLN MASTERPIECES. By Benjamin Barondess. 156 Pages. Education Foundation of West Virginia, Inc., Charleston, W. Va. $3.00.

A HISTORY OF THE SOUTHERN CONFEDERACY. By Clement Eaton. 351 Pages. The Macmillan Co., New York. $5.50.

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